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INFLUENZA NUMBER

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Chester A. Darling, Ph.D.

The [redacted] Treatment of Influenza
[redacted] Surgeon General William A. Brooks

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The Use of Convalescent Human Serum in Influenza Pneumonia (Preliminary Report)
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The Use of Influenza Vaccine in the Present Epidemic
Timothy Leary, M. D.

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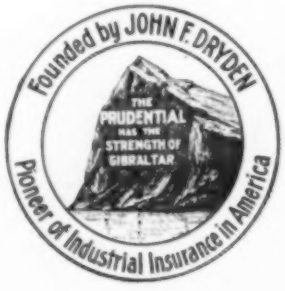
CHARTS

Accidents Cancer Tuberculosis Malaria
Whooping Cough Measles Diphtheria



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THE USE OF CONVALESCENT HUMAN SERUM IN INFLUENZA PNEUMONIA—A PRELIMINARY REPORT.*

L. W. McGuire,
Lieutenant Commander, M. C., U. S. N.,
and
W. R. Redden,
Lieutenant, j. g., M. C., U. S. N., U. S. Naval Hospital, Chelsea, Mass.

WE are all aware of the high degree of fatality resulting from the pneumonia following the influenza of the present epidemic. All of our deaths have been due to the pneumonia complication and none to the influenza as such. Here at the Naval Hospital, the percentage in the first groups reached as high as 50 to 60, and more recently the mortality has dropped to 30 per cent. No doubt this complication will continue to give a high mortality rate, especially when the disease invades new territory. For this reason, the authors have decided to make public their results in the treatment of a small group of cases, by the use of serum from patients convalescing from pneumonia, following an attack of influenza. It will be readily seen that a complete report at this time is out of the question, but we hope to present sufficient data to indicate the possibility in the use of convalescent serum so that further work can be carried on in territory where the disease is now active, and where proper equipment is at hand to carry out the necessary laboratory details.

The observation and treatment, by the writers, of over four hundred cases of influenza pneumonia in this hospital has afforded opportunity to compare the various methods of treatment with a fair degree of accuracy.

The use of serum from convalescent influenza pneumonia patients was suggested by the junior writer as possibly having curative value, because of probable antibody content. The reason for this was the experimental evidence presented by Flexner and Lewis,† with convalescent serum from poliomyelitis patients, and later the clinical evidence presented by Amoss and Chesney,‡ during the poliomyelitis epidemic in 1916.

The serum was first tried on two patients with a very severe and extensive broncho-pneumonia—an officer and a nurse. The officer developed influenza September 23. On the 26th he had some evidence of a beginning broncho-pneumonia. His temperature was 103; some elevation of pulse and respiration. On the 28th, he was desperately sick; temperature 104.4°; respiration 36; pulse 104; he had considerable nausea and vomiting, looked toxic and had beginning cyanosis and vaso-motor disturbances; also a profuse sanguino-purulent expectoration; 100 cc. of serum was given at 1.30 p. m. Another 100 cc. at 8 p. m. The next morning, the 29th, patient was distinctly improved; less nausea, cough and expectoration; temperature 102; respiration 40; pulse 104; 75 cc. of serum given at 11.30 a. m. On the 30th, a decided improvement noted; 8 a. m. temperature 100.8°; respiration 30; pulse 88; 75 cc. serum given; temperature normal at 4 p. m. Patient in excellent condition,

* This article is reprinted from the *Journal A. M. A.*, to whom the thanks of this Journal are due.

† Flexner & Lewis showed definite exp. results in monkeys. Jour. Amer. Med. Assoc. 1910, Liv. 1780.

‡ Amoss & Chesney, Jour. Exper. Med. 1917, XXV, 581, and others.

stating that he felt well; after which he made an uneventful recovery. Laboratory report of sputum injected in peritoneum of mouse showed influenza bacilli and type IV pneumococcus.

The nurse took sick with influenza on September 24th. On the 27th, running a continuous temperature of 103; respiration 36; pulse 104. On the 29th, temperature reached 104; respiration and pulse same. Areas of broncho-pneumonia present, especially in the right middle lobe. Patient very toxic, unable to keep anything on her stomach for three days. Water given per rectum. Marked cough and muco-purulent expectoration present. At 11 a. m., the 29th, 100 cc. serum was given. On the morning of the 30th, patient ate some breakfast and was much improved, although very sick; vomiting practically stopped. Temperature 103; pulse 114; respiration 22; 75 cc. of serum given. October 1st, temperature normal; all symptoms subsided and she made an uneventful recovery. See clinical charts.

Up to the present time, thirty-seven cases in all have been treated with serum. This represents all the pneumonia patients who have been admitted since October 1st, except the officer and nurse previously mentioned. Of this group, thirty are convalescent; six are under treatment; one dead. Of the six under treatment, two are much improved; two have received only one injection of serum; two cases not improved, one of whom is critically ill. Of the thirty convalescents, eight received treatment on the second day of the pneumonia; fifteen on the third day; four on the fourth day; three on the sixth day. Of the six under treatment, three received serum on the second day; two on the third day, and one on the fourth day. The fatal case received the first serum on the fifth day.

Serum Treatment

Convalescent patients were bled as soon as convalescence was well established, the majority within a week or ten days of a drop to normal temperature. The serum was given as early as the diagnosis of the pneumonia complication could be made, so there has been no doubt about the lung involvement. The dose of serum has varied from 75 cc. to 125 cc. intravenously and the interval between doses has varied from eight to sixteen hours. Treatment was continued until there was no doubt about the recovery of the patient. The majority received about 300 cc. Three received only 100 cc. and two received from 600 to 700 cc. It was found, as we anticipated, that there was a marked difference in the potency of the convalescent serum. At least ten out of seventy sera had no effect on patients. Under these conditions, the succeeding doses of serum were from other patients. Results from this serum are usually obtained in the first twenty-four hours after its use. If no results are obtained this time, the serum from another donor should be used. An attempt was made to judge the potency of the serum by the amount of lung involvement. This was done by obtaining careful statement of the physical findings and the clinical course of the disease in the donors.

Procedure

Wassermann tests were made on all donors as soon as possible in order not to waste time on bleeding those who showed a positive reaction.

Compatibility tests of donors' serum, with recipients' corpuscles, was made as soon as new cases appeared on the ward. Then usually ten to fifteen sera were tested against the corpuscles of each recipient in order to have plenty of available serum for complete treatment.

Blood to the amount of about 800 cc. was taken from each donor, under sterile precautions; 400 cc. at a time on two successive days. Thus each donor yielded about 300 cc. of serum. The blood was allowed to clot at room temperature for about an hour, then plate cultures were made, and the containers placed on ice over night. The separated serum was cleared by centrifugalizing at high speed; of the above amount of blood. In fact, the majority wanted to give more.

An attempt has been persistently made to test the potency of the serum of the donors by complement fixation and by gross agglutination, using the recently isolated influenza bacillus as an antigen, but as yet we have found no method of testing the antibody content of serum except by its clinical action on recipients.

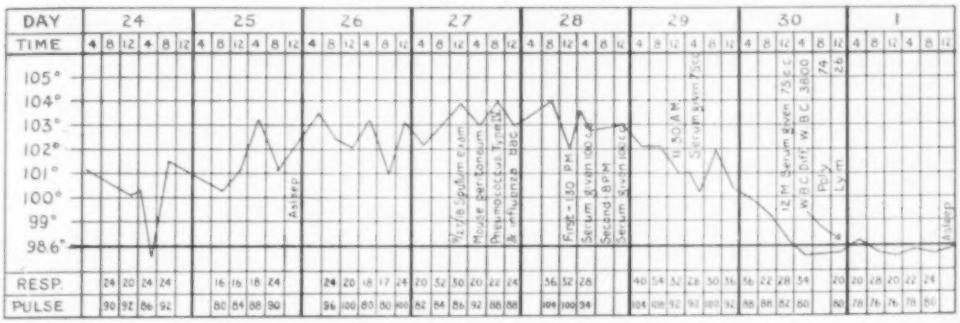


FIG. 1. Temperature Chart of Officer.

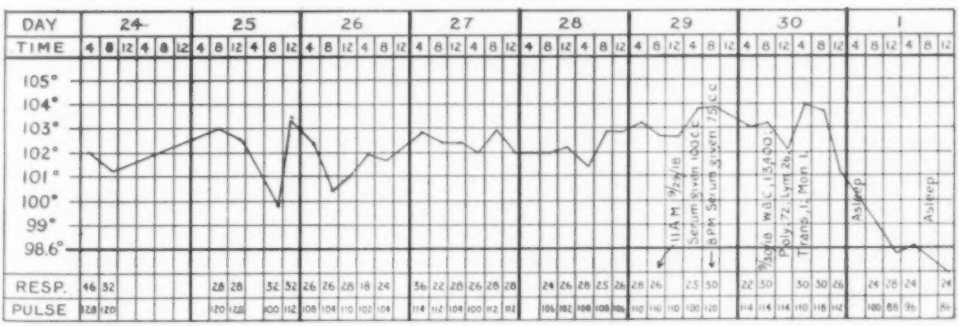


FIG. 2. Temperature Chart of Nurse.

then bottled, and in most cases given the same day. Trikresol (0.30 per cent) was used only in serum kept over twenty-four hours. It is interesting to note that only four patients had chills after the serum injections. All of these received serum containing trikresol, while three others receiving trikresolized serum gave no such reaction. At no time has a donor been inconvenienced by the withdrawal

CONCLUSIONS

Treatment of influenza patients with the pneumonia complication by the use of convalescent serum was started at this hospital September 28, 1918.

Up to the time of writing, thirty-seven pneumonia cases have been treated. Of this group, thirty are convalescent; six are under treatment; one has died; all but one of these have a favorable outlook.

At present, the potency of the convalescent serum can be tested only by its clinical effect. Further attempts are being made to titre the serum.

Experience shows that the most beneficial results will be obtained by giving the proper serum within the first forty-eight hours of the penumonia complication..

It has been our observation that the virulence of the organism has decreased in this hospital as the epidemic progressed, but, making allowance for this diminution in severity of the pneumonia cases, it is believed that the serum from convalescent influenza pneumonia patients has a decided influence in shortening the course of the disease and in lowering the mortality.

This treatment requires the coöperation of a well-equipped laboratory, where the proper laboratory procedure, as previously noted, can be performed; and should be used only by those who are prepared to have this necessary laboratory work carried out.

◆

CENTRALIZED HEALTH AND RELIEF AGENCIES IN AN INFLUENZA EPIDEMIC.

EUGENE R. KELLEY, M. D.,
State Commissioner of Health,
and
B. W. CAREY, M. D.,
Epidemiologist, State Department of Health, Boston, Mass.

THE earliest and most striking feature that came to our attention in planning our campaign for combating the pandemic of influenza, which has ravaged this state for the past month, was the absence of uniform methods of organization in the various health agencies upon whom we were obliged to rely. It was perfectly apparent that everyone was anxious to help, each willing to work unceasingly till the appointed task had been accomplished, but there was likewise evidence that each wanted to go along in their own accustomed groove, not realizing that at such a time unification of effort and direction could only be obtained by the loss of their personal identity.

A short time sufficed to prove to us that unless we were to be buried under a multiplicity of agencies, and to court disaster, we must coördinate these forces under one administrative head to work for the common good of all. As calls for assistance coming to this department became more urgent, organizers were sent out by Miss Bernice W. Billings, who had immediate charge of the nursing forces, to investigate conditions in each city or town, ascertaining if possible if all local health agencies were giving maximum service to the locality in which they were situated.

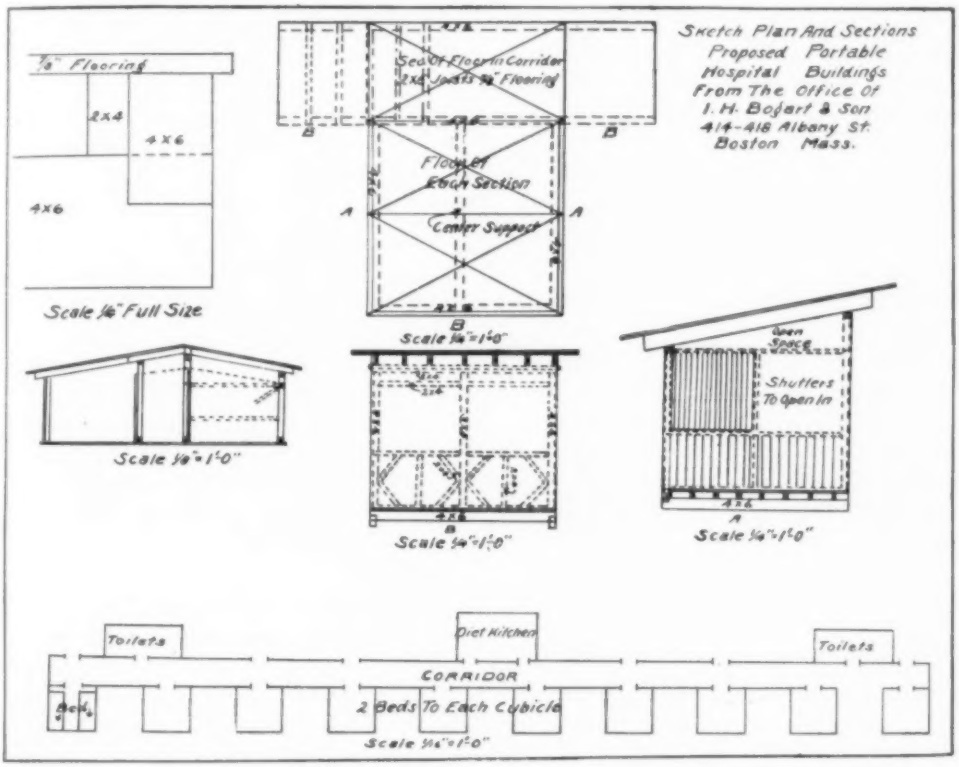
In many instances, it was clearly shown that if these local bodies would consent to centralization and coördination, they would be fully able to handle their own problem.

The law directs specifically that each local board of health shall make such regulations as it deems necessary for the control of communicable diseases within its limits, and here, already established, was a logical administrative head under which all activities for checking this outbreak were to be placed.

After several organizing visits had been made to various places, it was deemed advisable to formulate a plan for distribution to local boards of health, and to other

agencies, who were helping in the actual combating of this outbreak, or where it was evident that they would be called upon within a very short time to organize for their own protection.

The work of formulating this plan was allotted to Miss Amy Wood, general secretary for the League for Preventive Work, who early volunteered to assist in our work.



A brief summary of her plan is as follows:

Work must be centralized in permanent, or temporary, office of the boards of health.

This office to be kept open at all times with responsible person in attendance whose duty it shall be

(a) To receive all general calls for medical service, and to assign to doctors.

(b) To arrange for admission to emergency hospitals on call of doctor, and provide for ambulance service.

(c) To have assignment of cases ready promptly for visiting nurses and aids to start out at 8.30 a. m. and 1 p. m.

(d) To arrange for proper and continuous nourishment for patient, or for families, reported by doctors, or nurses, as in need.

(e) To receive reports from nurses.

(f) To receive daily reports from doctors of number of new cases, and deaths.

(g) To arrange for the proper care of the dead within twelve hours.

All doctors should be requested to refer to this central office all calls which they receive but cannot attend to within a reasonable time, and to accept cases, from this office, if they can attend to them. If the calls become too numerous for local doctors to handle, the local board of

health may call on the State Department of Health for assistance.

All nursing assistance should be under the direction of the central body.

The establishment of the emergency hospital is of special importance because with the grouping of patients it has been found feasible to obtain maximum efficiency with a minimum outlay of graduate nurses, utilizing lay workers working under their direction. The procedure in this state has been to have the mayor, or chairman of the board of selectmen, request the Adjutant-General for such assistance, this requisition to bear the approval of the district health officer. It was then forwarded to Surgeon-General Brooks, who took the necessary steps towards establishment of the tent hospital unit. The local board of health should be kept informed of vacancies in this hospital as they occur.

The assistance given by volunteer help has, in a large measure, been the saving factor in our fight. By directing their efforts, we were able to relieve doctors and nurses of everything save the immediate care of the sick. These forces furnished automobile service, arranged for supplies of foods, and, in fact, took care of detail which, if left to the ordinary channels, would have been a source of great difficulty.

Information dealing with prevention was prepared laying particular stress upon unnecessary fear which could be allayed by human contact and statement of actual facts. The distribution of the pamphlet, house to house visitation to seek out needy and sick families and attending to their needs were planned for in our circular.

Advice was likewise given as to the prophylactic measures in use such as the wearing of a gauze mask when in attendance upon patients, hand disinfection and the admonition added that local authorities take the best of care of those who were laboring for them and their community.

The success of this plan of centralization was only made possible by the coöperation of all the agencies who generously gave their time and thought, and to these the thanks of the State Department of Health is gratefully extended.

THE OPEN AIR TREATMENT OF INFLUENZA.

William A. Brooks,
Surgeon-General, Massachusetts State Guard.

BEFORE much of this influenza appeared in Boston there were rumors of it, and then one or two cases appeared. Doctor Croke, who had charge of the ships connected with the Recruiting Service of the Shipping Board at East Boston, was instructed that if a case was found all the attendants were to be masked with gauze masks.

One Monday morning Doctor Croke reported that he was getting a great many cases of influenza. A visit was made to the ships in East Boston, where men were found scattered about on the decks and in their bunks. Apparently there were too many cases for the hospitals in Boston to accommodate in a hurry.

Mr. Henry Howard, director of the Recruiting Service, was seen and a plan was suggested to him to establish a tent hospital on Corey Hill with the assistance of the State Guard. Colonel Stevens, the adjutant-general of the Massachusetts State Guard, consented to call out the State Guard at the expense of the Shipping Board. Colonel Emery, at half-

past two in the afternoon, was asked to provide tents and field equipment. Between half-past five and six o'clock the tents commenced to arrive at Corey Hill from Framingham. The Brookline Company of the State Guard was ready to erect them. Beds and hospital supplies were brought up from the Commonwealth Military Emergency Hospital. Laborers were obtained to make sewer connections and also to connect with the water supply. The State Guard medical officers were ordered to report and members of the Ambulance Corps with the ambulances came from the Commonwealth Military Emergency Hospital. Before midnight thirty-eight patients had been brought from East Boston and put to bed in the tents. For a few days the weather was bad, cold and rainy, making it extremely uncomfortable for the doctors and nurses. The tents, however, had been so thoroughly ditched by the Brookline Company that it is no exaggeration to state that the ground inside of the tents was kept perfectly dry. Within a few days many cases of pneumonia were brought to the camp. The attending physicians were greatly puzzled, for the pneumonias did not seem to be of the type which are generally met with. The patients became greatly cyanosed and the ordinary heart medicines like digitalis and strychnine apparently had no effect, and seven or eight deaths occurred in rapid succession. The attending physicians became much discouraged. Meanwhile Doctors Slack and Overlander were busy taking cultures. They soon reported that the influenza bacillus predominated in these cultures. They also found that both Type I and Type III of the pneumococci were present. They also found streptococci. Their reports indicated that the present epidemic was a mixed infection.

Fig. 1. Gloucester Hospital.*

In getting the history of the cases, Doctor Harrington found that the worst cases of pneumonia came from that part of the ships where the ventilation was the worst. Doctor Slack's analyses clearly demonstrated that we had to deal with the pus-producing pneumococcus. We were able to get reports from the autopsies at the Naval Hospital, showing that the men

* The illustrations in this article are furnished by courtesy of the *Boston Transcript*.

died, not from heart failure, but from abscesses in the lungs. This explained why the heart stimulants had had practically no effect on the cyanosed patients,

Fig. 2. Open Air and Sunshine, Camp Wm. H. Brooks, Corey Hill.

and that they died, not from heart failure, but from lack of air.

The medical staff thereafter determined to give the patients all the air possible. Thereafter, on pleasant days, every patient was taken out of the tents and put into the open.

From the first day, the results were startling. Almost every patient without exception had a lower temperature at night than in the morning, and felt decidedly more comfortable. The charts of these patients are very instructive and

Fig. 3. Convalescence Shack, Camp Wm. Brooks, Corey Hill.

clearly demonstrate the great value of plenty of air and sunshine for patients suffering from influenza and pneumonia.

From being discouraged, the medical staff became enthusiastic, and the patients were treated with the confidence that at last something had been found which would give good results.

At the end of three weeks the epidemic on the ships was practically under control, and in a few days over four weeks the tent hospital was closed. Out of between 5,000 or 6,000 men on the ships, between 1,200 and 1,400 had contracted the disease; 351 of the most serious cases were treated at the tent hospital, of whom 35 died.

Very few of the attendants and nurses contracted influenza while working in the tent hospital. One nurse who worked

Fig. 4. Out-Door Wash Stand, Hand Technique, Camp Wm. Brooks.

for the first two days, and undoubtedly had contracted influenza before coming to the camp, having been exposed to it in her own home, died at one of the hospitals in town. Another nurse died at another hospital in town.

The following facts were deduced from the experiences of the first tent hospital:

Period of Incubation.—Apparently it varies, averaging about two days. Sailors at work would be feeling perfectly well and then be suddenly stricken. Others would be ailing and then gradually come down. Fatigue seemed to play an important part.

The infection itself, as has been stated previously, was a mixed infection; and

where Type III of the pneumococcus predominated many of the cases were fatal. In many of the cases of pneumonia, the diagnosis was made by Doctors Slack and Overlander from the sputum before any signs could be detected in the chest.

Fig. 5. Lawrence Hospital, Panorama View.

Medical Treatment.—Very little medicine was given after the value of plenty of air and sunshine had been demonstrated. Practically only three drugs were used: Dovers powder, some form of aspirin, and iodide of lime in one-third grain doses. The patients were fed every two or three hours, and given a variety of food with plenty of fruit. They were also made to drink plenty of water. Their feet were kept warm with metallic hot water bags, or else by means of heated bricks wrapped in newspapers. Owing to the danger of leakage, rubber hot water bags were avoided as much as possible.

Mask Technique.—Before the tent hospital had been established very long, it was found that the ordinary masks made out of a number of layers of gauze were very unsatisfactory. Nurses and attendants were constantly dropping the masks, and replacing them with the wrong side next to the mouth and nose. Improvised wire masks were made out of ordinary gravy strainers. The strainer was shaped to fit the nose, and five layers of gauze were simple basted on to the wire frame. No attendant or nurse was allowed to go near a patient unless wearing one of these masks. The gauze on the masks was changed every two hours. It was found impractical to sterilize the mask with the gauze on, owing to the fact that in the process of sterilization a great deal of the fuzz on the gauze was removed and its value as a strainer was diminished. Nurses and orderlies were instructed to keep their hands away from the outside of the masks as much as possible. Every wearer of a mask was inclined at first to wear the mask too high up on the nose and a great deal of discomfort was caused by this. The upper end of the mask should simply rest above the nostrils, and the lower part should come under the chin. The two tapes on the masks were tied over the ears at the back of the head or neck. There was a superintendent of masks

Fig. 6. Cook Tent, Camp Wm. Brooks.

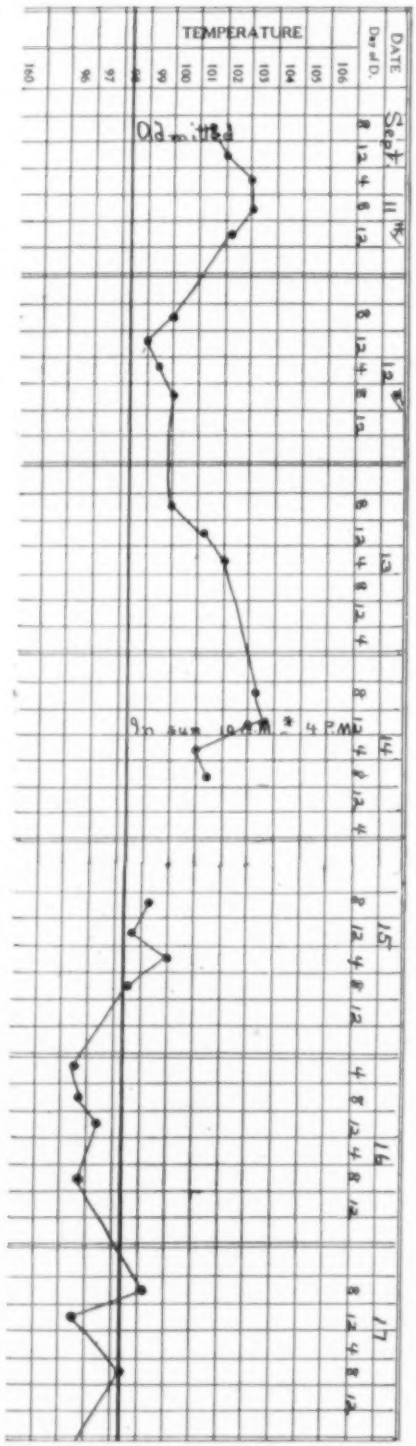


Fig. 7. Chart showing fall of temperature with open air treatment. The break between the 14th and 15th days represents the juncture of two history sheets.

whose duty it was to see that all the masks were changed every two hours, and to see that they were properly sterilized and fresh gauze put on.

Technique of Hands.—Every nurse and attendant was cautioned that, after working over patients, the hands should be washed thoroughly either in 1/1000 corrosive sublimate solution, or in a solution of triple lysol. Before going to mess it was required of all nurses that they wash their hands and then go directly to mess.

Observations.—There is apparently a great opposition among many of the medical fraternity against open air treatment. Many of them seem inclined to think that, if the windows of a room are open, the same object is attained. Many think that the ordinary sun parlor of a hospital is "just as good." The facts are, however, that the patients do not thrive as well in any ordinary hospital, no matter how well it is ventilated, as they do when they are put right out into the open. The objection to the sun parlor is that one gets direct sunlight only during part of the day, whereas the patient who is out in the open gets the direct sunlight all day long. Certainly these results warrant medical men in visiting these camps to go over the records, examine the charts, and hear what the patients have to say in regard to the good effects of open air treatment.

The efficacy of open air treatment has been absolutely proven, and one has only to try it to discover its value. It represents the result of study by twelve or fourteen men, who, for a month, practically devoted their entire time to influenza and its complications. Compare the following data with the results cited above, obtained from open air treatment: in one general hospital there were seventy-six cases; within three days, twenty of these cases died, and seventeen nurses were down with influenza.

THE EPIDEMIOLOGY AND BACTERIOLOGY OF INFLUENZA.

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THE disease called influenza has probably existed for several centuries; it can be traced back with a fair degree of certainty to the fifteenth century and it is generally agreed that it must have been prevalent before that time. Several pandemics have been recorded, four having occured during the last century: one in 1830–33, a second in 1836–37, a third in 1847–48, a fourth in 1889–90. Pandemics are usually followed for several years by epidemics or sporadic outbreaks in different regions, so that nearly every year there are at least a few cases of so-called influenza in any given locality. A pandemic of the disease usually starts as a more or less severe local epidemic, more commonly in the Orient, and gradually spreads from that center along the lines of travel and at about the rate of travel. The pandemic of 1889–90 is believed to have started somewhere in the Far East in the spring of 1889; it reached Moscow in September of the same year, Petrograd in October, Berlin by the middle of November, London a month later, and New York the latter part of December. Within a year the disease had visited nearly every part of the world. The most plausible suggestion as to the cause of the sudden outbreak is that there develops a very virulent strain of the causative organism, possibly due to its passage successively from one individual to another, thereby increasing in virulence.

The present epidemic, which is assuming pandemic proportions, is believed by some writers to have originated somewhere in Western Asia, others speak of it as having started in Spain. During the past summer it is reported by Keegan (1), to have been prevalent in the army camps of both the Allies and the Central Powers and as having attacked from 30 to 40 per cent of the people in Germany, Italy, France, England, and Ireland. The disease began to assume epidemic proportions in the eastern United States in August and was probably brought to this country by patients or carriers from Europe. During the past two months most if not all of our army camps have been invaded and the civil population have suffered severely from the malady. In some of the camps it is reported to have attacked as high as 40 per cent of the men; since it is not a reportable disease, it is not possible to tell the proportion of persons attacked in the civil population. In the last epidemic of influenza in this country in 1915–16 it is roughly estimated that 40 per cent of the population in the large cities contracted the disease. Osler (2) says that with the exception of the tropical disease, dengue, there is no disease which indiscriminately attacks so large a proportion of the inhabitants. The season or the weather seems to have little to do in inducing an outbreak, although it may be noted that, up to the present epidemic, the greatest outbreaks in this country have occurred during the winter months, probably due to the lower resistance of the respiratory passages of the body during this season of the year.

The best evidence indicates that infection occurs through respiration, the causative organism being carried on dust particles and presumably lodging on the mucosa of the respiratory passages. The disease is probably not transmissible for great distances through the air owing to the lack of resistance on the part of

the organism to dry air for any length of time. The chief means of infection is believed by many to be the fine droplets expelled by a patient or a carrier from the respiratory passages in the act of sneezing, coughing, or talking. In addition to this so-called droplet infection, the causative organism may be obtained directly or indirectly from the patient or carrier who is careless about expelling the secretions from the nose or mouth; such secretions appear to be the only infective material.

At least from a theoretical point of view isolation and quarantine of the patient is the best means of controlling an epidemic, but owing to the large percentage of persons attacked, this method does not appear to be practical except under special conditions, such as in army camps and in certain institutions. The prevention of crowds by the closing of schools, churches, theaters, and all places of public gatherings where the danger from droplet infection is greatly increased is a practical measure which tends to lessen the number of persons subject to infection. In the care of the patient the wearing of a gauze mask by the nurse or attendant while in the same room is practiced in the army camps and in many hospitals and according to Weaver (3) is an efficient method of protection.

The incubation period appears to be short, especially in the present epidemic. One to three days after exposure the disease develops. The onset of the disease is very sudden, often in one to three hours the patient passes from apparent health almost to prostration. The clinical manifestations of the disease are usually a marked prostration, a temperature of from 101° to 105°, headache, pains of varying severity in the muscles and joints, an acute attack of coryza, or discharge from the nostrils, and inflammation of the mucus membrane of the upper respiratory passages, less frequently of the intestinal tract. The main danger connected with the disease lies in the complications which follow. In the present epidemic bronchitis followed by bronchopneumonia occurs in from 5 to 10 per cent of the cases, as reported by Keegan (1) for the First Naval District Hospital. Pleurisy, inflammation of the middle ear, less frequently pericarditis, abscesses, erysipelas, peritonitis, and appendicitis are complications which may follow, according to Mathers (4).

As to the bacteriology of the disease little work had been done up until the great pandemic of 1889–90. At that time observers did not agree as to the causative agent, both streptococci and pneumococci were found in sputum and in post-mortem material from cases of the disease. In 1892 Pfeiffer (5) succeeded in isolating and growing upon blood agar a bacillus which he found in abundance in the bronchial secretions of patients suffering from an epidemic at that time; he named this organism *Bacillus influenzæ*. Pfeiffer's observations were confirmed at the time by several workers and the organism, frequently spoken of as Pfeiffer's bacillus, came to be accepted as the causative agent in the disease. In the past five years, however, considerable evidence has been brought forward indicating that *Bacillus influenzæ* is not necessarily the organism primarily concerned in epidemic influenza. Among the workers who have brought forward such evidence may be mentioned Davis (6), Mathers (4), Williams (7), Clapps and Moody (8), and others; these have failed to find the influenza bacillus in any considerable number of cases which they have examined. Of a total of 2,245 cases of clinically reported influenza examined and reported by Moody, Williams, Mathers, Ruhemann, and Lord, 157 or 7 per cent gave positive findings for the influenza bacillus. Other

organisms commonly found by these investigators were *Streptococcus viridans*, *Streptococcus albus*, *Streptococcus hemolyticus*, *pneumococcus*, and *Micrococcus catarrhalis*. Mathers believes that the hemolytic streptococci are of more significance in the throat than are the influenza bacilli in cases of an epidemic. In this connection it should be noted that *Bacillus influenzæ* is frequently found in the throats and sputum of those suffering from pneumonia, tuberculosis, whooping-cough, measles, and chronic bronchitis, as reported by Davis.

In the present epidemic several investigators have found the influenza bacillus only occasionally. Hewlett and Alberty (9), reporting the epidemic from the United States Navy Base Hospital No. 2 in France, state that there is no unanimity of opinion as to the causative organism, many observers failing to find the influenza bacillus of Pfeiffer. The bacteriological findings at the United States Naval Hospital, Chelsea, Mass., as reported by Keegan, are of considerable interest in suggesting a possible reason for the failure of many bacteriologists to find the influenza bacilli in clinical cases of the disease. From over one hundred throat and sputum cultures from cases of influenza the predominating organism was a gram-positive diplococcus, the influenza bacillus being found only occasionally. From lung punctures and necropsies, however, nineteen out of twenty-three cultures gave colonies of *Bacillus influenzæ*, in six cases appearing as the only organism. The four cases which did not produce colonies of the influenza bacillus gave pure cultures of hemolytic streptococci.

The lack of agreement among bacteriologists as to the causative organisms in epidemic influenza may be accounted for in one or both of two ways; either because of the difficulty in isolating and in recognizing the colony of *Bacillus influenzæ*, or in the similarity of symptoms produced by several organisms, including the influenza bacillus. Considering the first possibility, Keegan suggests that the focus of infection of the influenza bacillus probably is not in the pharynx but in some recess of the nasal cavity; grounds for believing this he finds in the case of meningococcus which is found primarily in the back part of the nasopharynx, and the diphtheria bacillus which usually selects the region above the tonsils for its principal habitation. If this suggestion of Keegan proves to be the fact, then the ordinary swabbing of the throat and sputum examinations would give very uncertain results. Another difficulty which is met with in isolating the bacillus is in the very small colony which is produced under normal growth conditions, together with the transparency of the colony which in a mixed culture might be overlooked. Some workers maintain that there is a prohibitive action exerted upon the bacillus by other organisms which are commonly found in the throat, whereas Keegan maintains that when grown about a colony of staphylococcus, the colonies of the influenza bacillus assume a size three or four times as great as under normal conditions.

There is considerable evidence that other organisms than Pfeiffer's bacillus produce symptoms clinically diagnosed as influenza. Mather says that streptococci infection produces symptoms very similar to, if not identical with, those diagnosed as influenza. Park and Williams in their text-book make the assertion that there is no doubt that other infections are included under the clinical forms of influenza. It is a fact that the striking symptoms in acute respiratory diseases, as seen in the various types of pneumonia, are freqently due more to the location of the lesions than to the special variety of organisms producing them. In this connection the classification of Leichtenstern

as accepted by Osler may serve to minimize the confusion which has arisen relative to the causative organism in the disease. Leichtenstern has divided influenza into three types: first, epidemic influenza vera, caused by Pfeiffer's bacillus; second, endemic-epidemic influenza-vera, which often occurs for several years in succession after a pandemic, caused by Pfeiffer's bacillus; and third, endemic influenza nostras, a pseudo-influenza or catarrhal fever, commonly called grip, caused by various organisms alone or in combination.

The importance of knowing the causative organism is more appreciated during these days when vaccines and sera are of so much importance in the prevention and treatment of so many diseases. The opportunities given in our army camps for studying the disease under controlled conditions will doubtless throw considerable light not only upon the epidemiology of the disease but also upon the organisms concerned in producing such epidemics as the present one.

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THE USE OF INFLUENZA VACCINE IN THE PRESENT EPIDEMIC.

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THREE strains of influenza bacilli obtained from cases during the present epidemic have been used in the manufacture of vaccine. Strain "Carney" came from a culture from the nose of a nurse at the Carney Hospital. It was present in association with a white staphylococcus in abundant growth, in contrast to the picture obtained in most nose and throat cultures, which do not usually show the influenza bacillus. Strain "Navy" was procured from Lieutenant Keegan at the Chelsea Naval Hospital. Strain "Devens" was obtained from Major Spooner through Doctor Allen.

The technic used in the preparation of vaccine follows: 1½ per cent agar has been prepared from meat infusion (beef hearts) without glucose, and made 1 per cent acid to plenolphthalein. This is autoclaved for forty-five minutes at fifteen pounds pressure after tubing. Three to five drops of human blood are added to each tube. Blood is collected from the median basilic vein—15 to 40 cc. Poorest growth occurs when the blood is added to agar at 60° C. or below. Most abundant growth appears in tubes to which blood is added, with the agar at 80° to 90° C. The greater heat leads to a brown discoloration of the blood. Colonies on red agar (60° C.) are small, translucent and discrete, and produce a fine frosting on the surface. The growth on brown agar (80° to 90° C.)

is heavier, tends to be confluent, and more opaque.

Experience seems to indicate that organisms grown on red blood agar retain their virulence in higher degree, and furnish a more efficient vaccine. Brown blood agar furnishes a more abundant crop.

After the addition of blood the agar is slanted, cooled and incubated twenty-four hours in order to control its sterility.

We have prepared in this way up to 4,000 tubes of blood-agar per day.

Seed for planting is grown on selected red tubes. Heavy seeding of tubes used for vaccine is obtained by mixing the growth on the surface of seed tubes with the water of condensation, and transferring with a loop large amounts of the emulsion to the whole of the surface of fresh tubes.

Cultivation is carried out for fifteen to eighteen hours at 37° C.

After careful inspection of growths, with a hand lens, and the discarding of all doubtful tubes, 2 cc. of saline solution are added to each tube. The growth is scraped from the surface and emulsified by means of a platinum loop and shaking. The saline suspensions are collected in small flasks and filtered through sterile gauze, to remove fragments of agar. The suspensions are then exposed to 56° C. for twenty-five minutes in a water bath. The killed suspensions are then pooled in a large bottle and added to .5 per cent carbolized saline in a proportion varying from 1 to 10 to 1 to 20, depending upon opacity. Since we have been able to obtain Three Cresols, the suspensions have been diluted directly in saline solution, containing .4 per cent Three Cresols, and have not been exposed to heat. The dosage is essentially 400,000,000 per half cubic centimeter.

We have bottled vaccine in 10 cc., 30 cc., 50 cc., and 100 cc. amber bottles, closed with test tube caps or closed nursing bottle nipples.

Sterility of vaccine is controlled by transfer of 1 cc. from each of ten bottles of each lot to blood agar, and to 25 cc. 1 per cent glucose bouillon in fermentation tubes. If controls are not satisfactory at first, storage of the vaccine will usually result in sterile controls within a few days.

Dosage.—The prophylactic dosage has been .5 per cent cc., 1 cc. and 1.5 cc. in three doses at twenty-four hour intervals. The therapeutic dosage has been .5 cc. every twelve hours. It is probable that all of these doses are too small, notably the therapeutic dose. Many men are obtaining best results with 1.5 to 2 cc. at twelve to twenty-four hour intervals.

Prophylactic Use.—The prophylactic use of vaccine will not furnish as high protection as does typhoid prophylaxis, probably because the exposure is greater and infection more readily produced. The percentage of complete protection appears to be high, and there is marked amelioration of symptoms in those who do come down, and pneumonias appear in very few cases.

Therapeutic Use.—The therapeutic use of vaccines is followed by the best results when large doses are exhibited early in the disease. It should be possible to abort a large percentage of the cases, and prevent the development of pneumonia. After pneumonia has developed, many clinicians report excellent results under large doses of vaccine. The disease is a local disease, usually limited to the respiratory tract. Blood cultures are constantly negative during life or after death. If the pneumococci or streptococci which occur in symbiosis with the influenza bacillus in the lung processes were important factors, one would expect to find them present in blood cultures at some time in the course of the disease. For

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MODERN ADVERTISING AND THE NOSTRUM EVIL.

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To be read before the Food and Drugs Section, American Public Health Association, Dec. 9-12, 1918, at Chicago, Ill.

THE evils connected with the sale of medicinal preparations of the home remedy type—the so-called "patent medicines"—are due to proprietaryship and to the advertising methods that such proprietaryship engenders. The term "patent medicines," while a misnomer, is so firmly established that its continued use seems desirable. It is applied to products, almost invariably secret in composition, that are sold under trade-marked names for the self-treatment of disease. The so-called "patent medicines" are not patented; in fact their manufacturers could not patent the products if they would and they would not if they could. They *could* not patent them because the products represent nothing new and useful, two elements that are essential to the granting of a patent; they *would* not patent them because patency, or openness, is the last thing that the average manufacturer of "patent medicines" wants.

By obtaining a trade-marked name for his product the manufacturer—or, more correctly, the exploiter, for many preparations of this sort are not made by those who sell them—gets a perpetual monoply on his preparation, instead of the seventeen-year monoply which the patent laws grant. By keeping the composition secret he can change the ingredients to suit his whim, or to take advantage of market conditions, and, more important, he is able to make claims of the most extravagant kind behind the veil of mystery that is thus raised. The perpetual proprietary monoply which the "patent medicine" seller thus enjoys makes extensive advertising profitable and has led to the gross abuses which has made the "patent medicine" business a menace to the public health.

It may be asked why there should be an objection to proprietaryship in medicaments if there is no objection to proprietaryship in other articles of trade. The answer is that there are different problems involved and immeasurably greater interests at stake. One is wholly an economic question; the other is primarily a question of public health, the economic phase being of minor importance.

MISTAKING SEQUENCE FOR EFFECT.

The man who advertises and sells a preparation for the alleged cure or alleviation of disease has an important commercial advantage over the seller and advertiser of general merchandise. The former has Nature working in his interest; the latter has Nature operating against him. The man who sells a suit of clothes or a piano or an automobile has natural forces (as expressed in wear and tear) as his competitor; the man, on the other hand, who sells a "patent medicine" has the forces of Nature as an assistant. The man who purchases a suit of clothes or a piano, even if he is not an expert judge of such merchandise, can tell in time whether or not he received value for his money; but the man who purchases a remedy for the treatment of a physical condition cannot know whether he has been humbugged because he is incompetent to decide whether, if he gets well it is *because* of the remedy taken or in *spite* of it.

There is a universal tendency to give

credit to artificial agencies for results which are really due to natural causes. There are few who are able to distinguish between cause and effect and a mere sequence of events. *Post hoc, ergo propter hoc* is the popular mode of reasoning. For example: John Doe has a passing indisposition from which, in the natural course of events, he would recover in a day or two. Obsessed, however, with the idea that he must take some positive action, he goes to his family physician who gives him some advice of a dietetic or hygienic nature and may possibly prescribe some simple drug. In the course of time Mr. Doe is himself again and the doctor's reputation enjoys a bull market, although it is altogether likely that his advice or drugs had but little to do with the recovery. Or it may be that John Doe, instead of going to the doctor, decides to take the latest advertised panacea which, of course, is recommended for just the symptoms he seems to have. In this case, also, John recovers in about the same time, and the remedy gets the credit for a result brought about by Nature. In a word, those selling remedial agents not only have the advantages of making a lucky fluke but also have the much greater chance of being given credit for results to which their remedies in no way contributed.

It is this basic fact which invalidates the claim often made by the sellers of drug products that the wide sale of their preparations over many years is proof positive of the value of the remedies. Superficially the argument seems to have weight because when applied to other merchandise it holds good. Forceful advertising may make an indifferent, or even a worthless article of general trade a profitable "seller" for some time. Sooner or later, however, the accumulated experience of the public neutralizes the "pulling" power of an advertisement and the product dies. In the case of remedial products, however, no matter how worthless they may be, the accumulation of experience is all in the other direction. Such experience is largely to the effect that whereas the purchaser was indisposed *before* he took the remedy, he was well, sooner or later, *after* taking it! And it is utterly hopeless to try to convince the man who is not scientifically trained that the fact is merely a sequence and not an effect. Add to the selling advantages of remedial merchandising, already formulated, the fact that the products may and frequently do contain drugs possessing well-marked physiologic effects (alcohol, opiates, sedatives, laxatives, etc.) and the lure becomes almost irresistible.

Advertising That Makes for Ill-Health.

Modern advertising differs from its earlier prototype in that whereas the latter chiefly, if not exclusively, notified the public where and how its demands might be supplied, the former is based largely on the principle of creating demands for the products advertised. In the case of general merchandise there may be some excuse for these attempts to create in the minds of the public a desire for certain things it would not, otherwise, want. Some economic argument may conceivably be built up in defense of the proposition that the public should be impelled, through plausible and persuasive advertising, to purchase more pianos, more motor-cars, more hats or more clothes than it really can afford or has use for. No such excuse can be put forward in favor of the sale of medicaments. No man has any moral right to so advertise as to make well persons think they are sick and sick persons think they are very sick. Such advertising is an offence against the public health.

And yet a study of modern medical

advertising shows clearly that this is exactly what is being done. By the skillful use of testimonials, by plausible claims, direct or inferential, the vendors of remedial products lead the public to magnify every trivial ailment, to deceive those who are well into the belief that they are sick, and further, to impress the idea that their products are panaceas for whatever ailments the public is suffering from or can be deceived into believing itself to be suffering from.

Plenty of Non-Proprietary Home Remedies.

Under present economic conditions there is a place for medicaments of the home-remedy type for the self-treatment of simple ailments. Such remedies, however, should conform to certain simple rules. They should contain no dangerous or habit-forming drugs; they should not be recommended for diseases that are obviously too serious to be self-treated; they should be non-secret, that is, the names and amounts of all the active ingredients should be declared on the label; and finally, they should not be sold under claims that are false and misleading, or that will tend to make the public magnify trivial ills and dose itself unnecessarily with drugs. These requirements are fundamental, and their reasonableness is so obvious as to require no argument. It is virtually hopeless, though, to expect the vendors of proprietary remedies to conform to them. It is hopeless because, as a commercial proposition the margin of profit in the sale of remedies thus sold would be so small as to offer no attraction to individuals who had but one or two products to market. As a matter of fact, there is everything to be said in favor of non-proprietaryship in the sale of home remedies. There is already on the market in the form of official products an ample list to meet every legitimate requirement for medicaments for self-treatment. Such preparations are to be found in the Pharmacopeia or in the National Formulary; their composition is non-secret; their purity is established and protected by law. As any competent pharmaceutical house can make them, the elements of secrecy and proprietaryship are removed and the incentive to fraudulent or misleading advertising claims is abolished.

Under ideal conditions such products, if advertised at all, would be advertised by the individual druggist that had them for sale and the advertising "copy" would be of the "listing" rather than the "selling" type. Just as today the druggist occasionally lets the public know that he has on sale at specified prices, castor-oil, Epsom salts, compound cathartic pills, etc., so he would further extend that list were the public dependent on preparations of this type for the self-treatment of their simpler ailments. It is, of course, against the tenets of twentieth century advertising simply to offer products for sale rather than to attempt to sell them. But the fundamental difference between ordinary merchandise and products that are sold for the alleviation or cure of human ailments, is so wide and the social problem involved is so deep that there are good and sufficient reasons for abandoning modern advertising methods in selling medicaments.

THE EFFECT OF PUTREFACTIVE ODORS UPON GROWTH AND UPON RESISTANCE TO DISEASE.

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To be read before the Sanitary Engineering Section, American Public Health Association, Dec. 9–12, 1918, at Chicago, Ill.

THE idea,—once so widely current,—that odors of putrefaction play an important part in the causation of disease, was in the main no doubt due to natural but wholly erroneous assumptions. The conclusion that what was esthetically unpleasing would also be harmful was a tempting one; and the fact that filthy conditions, which lead to foul odors, may also, as a matter of fact, tend to favor the spread of disease germs, by flies and in other ways, helped to confuse the issue.

In addition to such unjustified assumptions there has been before us, for the last twenty years, at least one definite and apparently carefully conducted piece of experimental work which seemed to demonstrate a specific effect of putrefactive odors on resistance to bacterial infection. This was the study conducted by G. Alessi at the University of Rome, translated into English and published in the *Journal of the Sanitary Institute* (Vol. XVI) in 1895.

Alessi's Experiments.

Alessi's experiments were made upon rats, guinea pigs and rabbits. The rats were exposed to putrefactive gases by placing their cage over an untrapped water-closet,—the guinea pigs and rabbits by placing beneath their cages vessels of excrementitious substances. The animals exposed to the gases of putrefaction "lost their usual vivacity and pined away, in spite of eating voraciously." After specified periods, they were inoculated with broth cultures, or suspensions of agar cultures, of two strains of typhoid-like organisms and one strain of *Bacterium coli*. Alessi points out that one of his supposed typhoid strains (A) was evidently not a true *Bacterium typhi*. The identity of the organisms is unimportant, however, since the amounts used for injection (.25–.50 cc.) proved generally harmless to control animals injected in the same way. The animals which had been exposed to the putrefactive gases on the other hand were made seriously ill and a large proportion of them died, the typhoid or colon bacillus injected (as the case might be) being usually isolated in nearly pure culture from the blood, spleen and other organs.

The general results of Alessi's experiments are summarized in Table I below. The average time of exposure to the putrefactive gases "necessary for the animals to acquire the predisposition" was 3 to 6 days with guinea pigs and rabbits inoculated with Typhoid B and *Bacterium coli*, while for Typhoid A the average time was 5 days for rabbits, 18 days for guinea pigs and 22 days for the rats. It is not clear from the original paper how this time necessary to acquire predisposition was determined. It is stated however that "90 per cent of the animals inoculated in the first two weeks died, and 76 per cent of those inoculated in the following weeks," suggesting a gradually acquired tolerance. Death generally ensued within 24 hours after inoculation, though in a few instances the animals survived for as long as 13 days.

TABLE I.

SUMMARY OF ALESSI'S RESULTS ON EFFECT OF BREATHING PUTREFACTIVE GASES UPON SUBSEQUENT REACTION TO BACTERIAL INFECTION.

Culture Used	Type of Animal Inoculated	Percentage Mortality	
		Exposed Animals	Normal Controls
Bacterium typhi A.....	Rats	75	7
	Guinea pigs	79	0
	Rabbits	100	0
Bacterium typhi B.....	Guinea pigs	80	0
	Rabbits	70	0
Bacterium coli..	Guinea pigs	83	0

Finally, in the attempt to determine whether any of the known chemical constituents of the putrefactive gas complex could be shown to be responsible for these results, Alessi exposed rats and guinea pigs for periods of one to two weeks to the gases in question under bell jars and then inoculated them with the same sublethal doses of typhoid bacilli described above. The gases studied were retilindol, ammonia, sulphuretted hydrogen, methyl sulphide, carbonic acid, carbonic oxide, ammonium sulphide, alone, and in various combinations. All these known gases and mixtures proved innocuous. Out of 56 animals exposed only 3 died "from other causes."

DELÉPINE'S EXPERIMENTS AT MANCHESTER.

The next important contribution to this subject was made by Professor Delépine at Manchester, England (described in the Report of the Departmental Committee appointed by the President of the Local Government Board to inquire and report with regard to the use of Intercepting Traps in House Drains, London, 1912). Delépine was interested not in the general question of putrefactive gases but in the practical problem of sewer gas. His animals were kept in two rooms supplied by forced ventilation with air drawn, respectively, from a garden and from a main city sewer. The animals studied were cats, rabbits and guinea pigs (young, adult, normal and diseased). The period of exposure varied from 7 to 83 days and the chief criterion of the effect of the sewer air was the growth curve of the animals as shown by daily weighings. A careful comparison of the rate of growth of seventeen animals exposed to each condition failed to show any influence of the sewer air. No attempt was made to inoculate these experimental animals, but an epidemic "due to infected food" which broke out towards the end of the experiments gave an excellent chance of observing any difference in resistance toward naturally contracted disease. No such difference appeared; 9 out of 17 animals supplied with sewer air died during the course of the experiments as against 10 out of 17 supplied with garden air.

These experiments can scarcely be considered as conclusive, partly on account of the small number of animals studied, but chiefly because the air of a city sewer does not contain under ordinary circumstances any very heavy concentration of putrefactive gases. The results are important in connection with the possible effect of air pollution from street sewers (upon which they were designed to throw light); but they by no means exclude the possibility that strong concentrations of putrefactive gases, such as those with which Alessi worked, may have an effect such as that which Alessi claimed to have discovered.

RECENT COMMUNICATIONS OF PUNTONI.

The whole question of the effect of putrefactive gases upon health has been re-opened in a series of recent papers, again by an Italian worker, Puntoni.

In the first of these communications, on The Hygienic and Epidemiological Significance of Putrefactive Gases (Il Policlinico, Roma, XXI, 1914), Puntoni reports the exposure of white mice to gases evolved from the viscera of guinea pigs decomposing under water. The vessel in which the decomposition took place was kept at incubator temperature and, by means of an aspirator, air was drawn through the putrefying liquid, thence through a condenser tube where it was cooled and the excess of moisture removed, and finally through the bell jar in which the mice were confined. The mice exposed to the putrefactive gases in this manner all died, sometimes in 12 hours, sometimes after 10 to 12 days, showing "a pulmonary lesion of congestive nature and degenerative necrotic alterations of the liver, the kidneys and the intestine, caused by the destruction or elimination, through these organs, of the circulating poisons." The gases formed during the first 2 or 3 days were most toxic, killing the mice in 12 to 24 hours, while after the putrefaction had gone on for a week the mice exposed to the gases did not die. The putrefactive gases, it was estimated, formed less than 1 part in 1,000 of the total air aspirated through the apparatus.

In herbivorous animals such as guinea pigs, in whose intestines according to Puntoni colon-typhoid organisms are less abundant, the effect of the putrefactive gases was either absent or much less marked.

In a second paper on The Influence of Putrid Exhalations on Microbes of the Colon Typhoid Group Contained in the Intestine, Puntoni reports that the bacterial flora of normal mice is made up chiefly of colon bacilli of low virulence, while in the intestines of mice killed or made ill by inhalation of gases of putrefaction the colon bacilli become highly virulent and other forms resembling the typhoid bacillus make their appearance. In another series of experiments mice exposed to mildly toxic gases (from old putrefying infusions) were found to be highly susceptible to infection by mouth with typhoid and paratyphoid bacilli, while mice kept in the open air, but fed with the same cultures, remained well. This predisposing action of the putrid gases could not be demonstrated with dysentery and cholera organisms. It was concluded, not only that the resistance of the intestinal wall was lowered by the inhalation of putrid gases, but that the bactericidal power of the blood was definitely lowered.

Finally, in a third paper on The Action of Putrefactive Gases on Typhoid and Paratyphoid Microbes latent in the Intestine (Annali d'Igiene, XXVI, p. 3, 1916), Puntoni reports a series of experiments in which white rats were fed for periods of 15 to 20 days on food infected with typhoid and paratyphoid bacilli. After this period the animals were placed in sterilized cages and fed on dry foods, under which conditions the typhoid and paratyphoid bacilli quickly disappeared from their feces (within 48 hours). Three to fifteen days later the rats were exposed to putrefactive gases as above and, after they had succumbed to the toxic action, typhoid bacilli were isolated from the intestinal contents in 3 out of 13 cases, paratyphoid A in 1 case out of 11, and paratyphoid B in 1 case out of 9. Puntoni concludes that "when putrefactive gases are respired, they may injure the intestinal wall, reviving and making virulent the pathogenic microbes always present in the intestines."

The bacteriological results reported in these experiments do not appear to us particularly significant. In dead or moribund animals it is well known that intestinal bacteria will invade the tissues

and where the intestinal wall has been almost destroyed by necrosis (a condition described by Puntoni) virulent strains might naturally predominate. The important fact is that air aspirated through putrefying infusions under the conditions of the experiments contains substances (not necessarily gases, for solids and even bacteria might be carried through such an apparatus) highly toxic to white mice. The exposure in such an apparatus is however so very severe as to rob the experiments of much practical bearing.

Experiments of the New York State Commission on Ventilation.

A much more modest influence of air containing odoriferous substances is suggested by some experiments of the New York State Commission on Ventilation reported by Winslow and Palmer (Proceedings of the Society for Experimental Biology and Medicine, 1915, XXI, 141). Here the subjects were human beings and the exposure was to the ordinary air of an unventilated room, containing whatever substances are given off by the body and clothing of the occupants under such conditions, the temperature and humidity of the room being regulated by artificial means. It was found that "neither the pulse, blood pressure, body temperature, respiration nor metabolism are influenced to a measurable degree when human subjects are exposed for periods of from 4 to 7 hours to the air of a room in which all the chemical products due to human occupancy have been allowed to accumulate (so that the carbon dioxide averages over 30 parts per 10,000) —provided the temperature of the chamber be kept down." One unexpected effect however was noted. The subjects while in the experimental chamber were served with a luncheon, made up of weighed portions of known calorific value, and the amount of food left uneaten was weighed to determine by difference the amount consumed. Five series of experiments were made, one of which was vitiated by the fact that in the middle it was found that religious dietary laws were preventing the use of certain of the articles served. In this uncompleted series the subjects exposed to the stale air ate 4.9 per cent more than when supplied with fresh air on control days. In all the four completed and significant series, however, the subjects ate more on the fresh-air days, the percentage excesses being respectively 13.6, 8.6, 4.4 and 6.8 per cent. Each of these figures represents the average of from 71 to 196 meals. "These experiments," the authors state, "seem to warrant the conclusion that there are substances present in the air of an unventilated occupied room (even when its temperature and humidity are controlled) which in some way, and without producing conscious discomfort or detectable physiological symptoms, diminish the appetite for food."

These experiments are of course only in part analogous to those previously discussed, since there was no definite attempt to pollute the atmosphere with putrefactive gases. It may be assumed however, as a working hypothesis, that the effect of odoriferous substances from skin and clothing upon the sense organs was the most probable cause of the loss of appetite in these experiments. If so, they may fairly be considered to represent a very mild exposure to influences similar to those which operated in a more extreme form in Alessi's experiments.

Plan of the Present Investigation.

It was our plan in the present study to repeat the experiments of Alessi as closely as possible. The conditions of Delépine's work seemed to us too mild, and those of Puntoni too rigorous, to be

promising of valuable results. Young guinea pigs (weighing at the start between 150 and 300 grams) were used in all of our experiments, which were conducted in fifteen different series during the years 1916, 1917 and 1918, 261 animals in all being observed.

The method of exposure to the putrefactive gases was as follows: A galvanized iron box 4 feet wide, 2 feet deep and 3 feet high was constructed, divided into two equal vertical compartments, each holding two standard animal cages and each provided with a tightly fitted separate glass door. Fresh air to the amount of 1.5 cubic feet per minute for each compartment (amounting to 4 liters per minute per animal) was supplied to the box by a small centrifugal fan, the supply to each section of the box being carefully regulated by dampers. On the course of the branch duct leading from the fan to one compartment was inserted a chamber in which was placed a pan of fresh moist human or dog feces, so as to produce a strong fecal odor.

In each series of experiments, from 5 to 13 guinea pigs were placed in the compartment supplied with the air drawn over the feces, while a similar number of control animals were placed in the other compartment supplied with ordinary air. All conditions were apparently alike for both groups, except for the presence or absence of the odor. The period of exposure in different series varied from 4 to 30 days.

During the course of the experiments the animals were weighed to see whether any effect of the odor upon their growth curve could be detected, as would be the case if the guinea pigs were affected as human subjects were affected in the New York State Commission on Ventilation experiments. When the animals were removed from the experimental chamber they were inoculated with a culture of *B. coli* (Series I–X) or with diphtheria toxin (Series XI–XV) as described below, to detect any diminution of vital resistance such as was reported by Alessi.

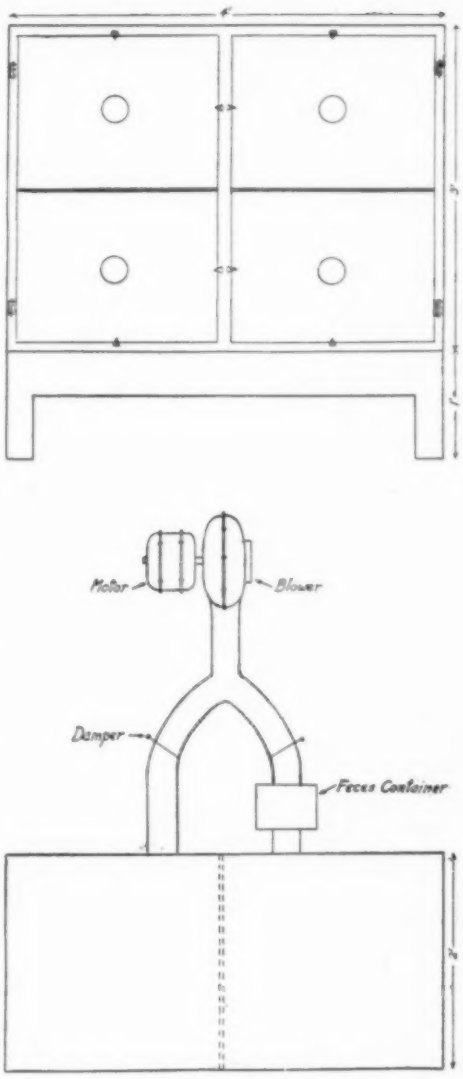

Fig. 1. Details of Experimental Chamber.

Effect of Putrefactive Odors upon Growth Curve of Guinea Pigs.

The average results of the weighings of each series are presented in Tables II and IIA in the form of average gain in

TABLE II.

AVERAGE GAIN IN WEIGHT OF EXPERIMENTAL ANIMALS—FIRST SIXTEEN DAYS.

Gains in Grams Per Day Since Beginning.

No. of Animals	Days															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I. *C. 12							17.8							19.8		
†E. 13							8.7							23.1		
II. C. 13					11.8						24.5				41.3	
E. 13					19.9						14.2				40.4	
III. C. 7						25.8										
E. 7						16.9										
IV. C. 10					15.6	27.0		29.3		37.2					48.0	
E. 10					12.4	24.6		27.4		34.5					28.0	
V. C. 11			7.6		9.6		13.9								32.8	
E. 11			8.7		12.1		19.6								34.2	
VI. C. 8			3.3			3.6								18.7		
E. 8			0.1			−0.1								16.7		
VII. C. 10			17.5			35.4			30.2			36.0				
E. 10			12.5			30.0			18.2			24.4				
VIII. C. 10		26.1		28.1	31.1			42.6		46.4						
E. 10		20.6		15.7	19.9			22.4		30.7						
IX. C. 9	11.0	8.4	8.8	12.9	12.2	13.1	7.2	2.2	10.2	11.4	15.8		15.6			
E. 9	7.3	5.8	8.0	11.1	11.9	15.5	11.2	15.0	19.8	19.8	24.2		29.4			
X. C. 10	21.4	12.6	18.2	11.5	16.6	18.9	12.4	19.5	19.2	22.4	24.2	28.4	25.0	27.5	28.0	28.5
E. 11	19.5	9.8	19.5	11.8	17.8	17.5	15.8	20.3	21.1	17.8	18.7	19.7	22.4	25.8	24.6	25.0
XI. C. 8	−3.9	−4.1	−5.5	−4.9	3.0	7.4	7.7	8.7	9.5	21.1	22.3	25.7	21.9	20.8	25.5	29.1
E. 8	−3.9	−3.8	−11.6	−16.8	−9.3	−6.3	0.6	8.0	7.4	16.6	20.1	24.9	18.5	20.0	25.7	30.1
XII. C. 9	−14.9	−15.3	−4.6	−7.3	−2.4	1.7	9.9	6.2	−1.0	−6.0	−2.0	7.3	17.0	−0.8	15.5	
E. 9	−13.6	−17.1	−7.8	−12.9	2.0	3.2	5.4	14.0	3.5	−4.3	6.0	12.7	22.5	1.8	23.8	
XIII. C. 6	4.3	10.7	13.7	14.0												
E. 5	1.6	4.6	5.4	9.2												
XIV. C. 7	7.6	12.6	13.6	17.3	19.6											
E. 7	11.6	11.7	16.4	21.0	20.0											
XV. C. 5	−16.0	−7.6	−6.6	−1.4	1.6	4.2										
E. 5	−14.2	−13.6	−23.0	−15.2	−10.6	−7.0										

*Controlled. †Exposed.

TABLE IIA.

AVERAGE GAIN IN WEIGHT OF EXPERIMENTAL ANIMALS—LATTER PART OF SERIES 1 AND 10.

Gains in Grams Per Day Since Beginning.

No. of Animals	Days													
	17	18	19	20	21	22	23	24	25	26	27	28	29	30
I C. 12						38.4				43.2				
E. 13						39.9				50.6				
X C. 10	32.2	37.4	36.8	40.0	38.5	42.2	43.6	53.2	55.4	58.5	60.2	58.9	60.5	65.2
E. 11	32.4	33.6	36.0	35.4	36.8	37.8	42.2	54.4	54.4	59.6	59.0	62.6	63.2	66.6

grams per animal since the beginning of each experiment.

It will be noted that the results for individual series were somewhat variable: in general however it was evident that the animals exposed to the fecal odor did not grow as fast for the first week as did the controls. Later, they gained more rapidly and by the end of two weeks had generally caught up. This relation appeared in 12 of the 15 series, while in the other 3 (Series 2, 5 and 14) it did not.

In order to eliminate the factor of individual chance variation, which must always be considerable in a single series of experiments involving the use of a few animals, we have calculated in Tables III and IV the per cent gain in weight for each series of animals (based on the weight of the series at the beginning of

TABLE III.

INCREASE IN WEIGHT OF ANIMALS EXPOSED TO PUTRID GASES.

In Per Cent of Original Weight of Each Series Gained Since Beginning.

Series	Days														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	*.6*	*1.2*	*1.8*	*2.4*	*2.9*	*3.5*	4.1	*5.1*	*6.0*	*7.0*	*7.9*	*8.9*	*9.9*	10.8	*11.7*
2	*1.6*	*3.3*	*5.0*	*6.7*	8.5	*8.2*	*7.9*	*7.5*	*7.2*	*6.9*	6.6	*9.6*	*12.7*	*15.8*	19.0
3	*1.1*	*2.3*	*3.4*	*4.6*	*5.8*	7.0									
4	*1.2*	*2.4*	*3.7*	*4.9*	6.2	2.4	*13.1*	13.8	*15.6*	17.4	*16.9*	*16.5*	*16.0*	*15.5*	15.0
5	*1.6*	*3.2*	4.7	*5.6*	6.6	*8.6*	10.6	*11.7*	*12.9*	*14.1*	*15.3*	*16.4*	*17.6*	*18.8*	20.0
6	*.0*	*.1*	.1	*.1*	− .1	− .1	*1.7*	*1.6*	*2.5*	*3.4*	*4.3*	*5.2*	*6.1*	7.0	
7	*2.5*	*5.0*	7.6	*11.0*	*14.5*	18.2	*16.0*	*13.8*	11.7	*12.9*	*14.3*	15.6			
8	*5.4*	10.9	*9.6*	8.4	10.6	*11.5*	*12.4*	13.4	*15.8*	18.3					
9	3.8	3.0	4.1	5.7	6.1	8.0	6.6	8.7	11.6	11.6	14.1	*15.6*	17.2		
10	12.6	6.2	12.6	7.6	11.4	11.2	10.2	13.1	13.5	13.2	13.6	14.3	15.8	18.2	17.9
11	−1.6	−1.6	−4.9	−6.9	−3.9	−2.6	3.0	3.3	3.1	6.9	8.7	10.4	7.7	8.5	10.7
12	−5.3	−6.7	−3.0	−5.0	.8	1.3	2.2	5.9	1.6	−1.8	2.6	5.5	9.4	.7	10.0
13	.8	2.2	2.6	4.4											
14	6.5	6.5	9.1	11.7	11.2										
15	−3.9	−3.7	−6.2	−4.2	−2.9	−1.9									
Average	1.8	2.3	3.3	3.8	5.6	6.6	7.7	8.9	9.2	10.0	10.4	11.8	12.5	11.9	14.8

TABLE IV.

INCREASE IN WEIGHT OF CONTROL ANIMALS.

In Per Cent of Original Weight of Each Series Gained Since Beginning.

Series	Days														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	*1.2*	*2.4*	*3.5*	*4.7*	*5.9*	*7.1*	8.3	*8.4*	*8.6*	*8.7*	*8.9*	*9.0*	*9.2*	9.3	*10.4*
2	*1.0*	*2.0*	*3.0*	*4.0*	5.0	*6.1*	*7.2*	*8.3*	*9.5*	*10.6*	11.8	*13.7*	*15.6*	*17.5*	19.5
3	*1.8*	*3.6*	*5.4*	*7.2*	*9.1*	11.0									
4	*1.5*	*3.1*	*4.7*	*6.2*	7.8	13.6	*14.2*	14.8	*16.7*	18.7	*20.4*	*22.1*	*23.8*	*25.6*	27.3
5	*1.4*	*2.8*	4.1	*4.6*	5.2	*6.4*	7.6	*9.0*	*10.5*	*12.1*	*13.6*	*15.1*	*16.6*	*18.1*	19.7
6	*.5*	*.9*	1.4	*1.4*	*1.5*	1.5	*2.3*	*3.2*	*4.0*	*4.9*	*5.8*	*6.6*	*7.5*	8.4	
7	*3.4*	*7.0*	10.7	*14.4*	*18.0*	21.5	*19.9*	*18.2*	16.7	*17.7*	*18.8*	19.9			
8	*6.3*	13.9	*14.4*	15.0	16.6	*19.4*	*22.3*	25.3	*26.4*	27.6					
9	5.7	4.4	4.5	6.7	6.3	6.8	4.0	1.2	5.6	6.3	8.7	*8.6*	8.6		
10	13.4	7.9	11.4	7.2	10.4	11.8	7.7	12.2	11.9	15.4	16.5	19.5	17.2	18.9	19.1
11	−1.6	−1.8	−2.3	−2.0	1.3	3.1	3.2	3.7	4.0	8.8	9.3	10.7	9.1	8.7	10.7
12	−5.8	−6.0	−1.8	−2.9	−1.0	.7	3.8	2.7	− .4	−2.6	− .8	3.1	7.3	.3	6.6
13	2.3	5.4	6.9	7.2											
14	4.2	7.0	7.6	9.6	10.9										
15	−4.4	−2.1	−1.8	− .4	.4	1.1									
Average	2.1	3.4	4.8	5.5	6.9	8.5	9.1	9.7	10.3	11.7	11.3	12.8	12.8	13.4	16.2

the experiment). For days on which weighings were not made, values have been interpolated, on the assumption of a steady progressive change between weighings, these figures being indicated by italics in Tables III and IV. Periods beyond 15 days have been omitted on account of the small number of observations.

Finally the average daily per cent increase in weight for exposed and control animals have been calculated in the last lines of Tables III and IV and these values are plotted in Figure II.

It appears evident from these figures that the breathing of the gases from putrefactive materials did exert a restraining influence upon the growth of the exposed animals during the first week of exposure, but that this effect was a transitory one, the exposed animals becoming gradually accustomed to the odor and growing as fast or faster than the controls during the second week.

Effect of Putrefactive Odors upon Vital Resistance of Guinea Pigs.

At various periods during the course of the experiments animals were taken in equal numbers, from the compartment exposed to the putrefactive odors, and from the control compartment, for inoculation, to test the possibility of diminished vital resistance; and at the end of each series all the remaining animals were subjected to the same treatment.

In Series I–X the inoculation was made with living cultures of *B. coli* to duplicate Alessi's experiments. The organism used was No. 52 of the American Museum of Natural History collection, a strain originally isolated from the Chicago River. A standard loopful of this organism was transferred from nutrient agar to nutrient broth and incubated for 18 hours at 37° C. One standard loopful of this broth culture was then spread evenly over a measured area of an agar slant and incubated for 18 hours at 37° C. The growth was then washed off and suspended in 5 cc. of normal saline solution. Preliminary tests indicated that one eighth of a cubic centimeter of such a suspension was constantly lethal when injected intraperitoneally, while one ninth of a cubic centimeter sometimes produced a fatal result, and sometimes failed to do so. One ninth of a cubic centimeter was therefore

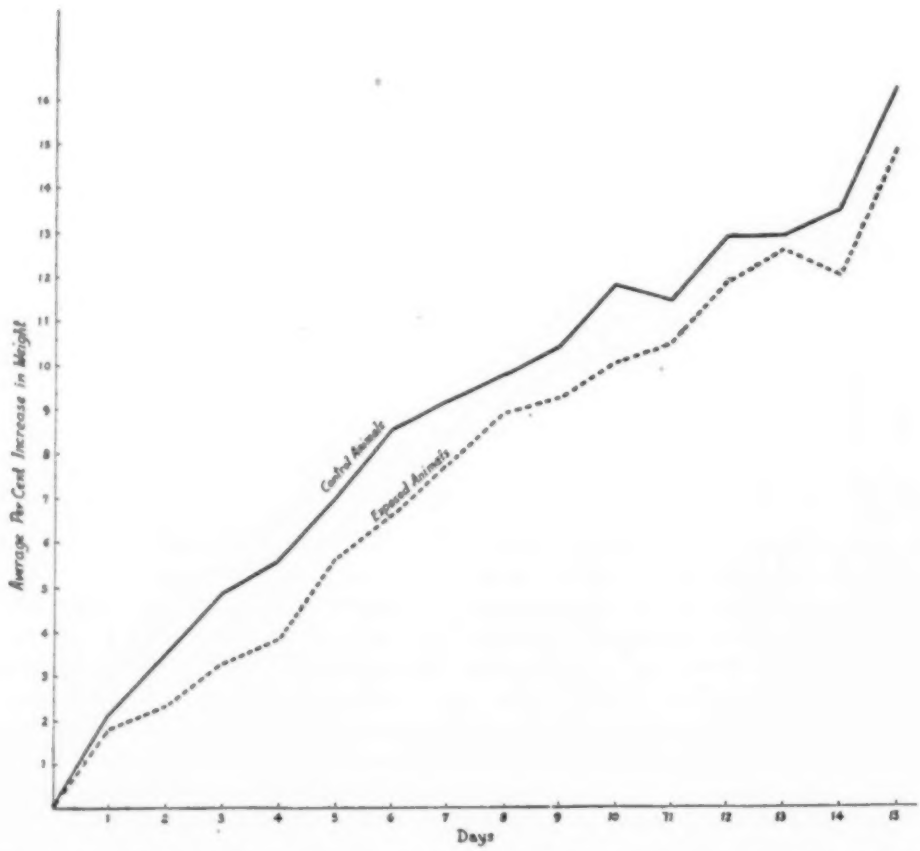

Fig. 2. Growth Curve of Guinea Pigs Exposed to Fecal Odors Compared with Curve for Control Animals.

injected peritoneally as our standard test of vital resistance.

The periods of exposure to the putrefactive gases at the end of which the inoculations were made varied in the different series from 5 to 26 days. The results of the inoculations are shown in Table V, without reference to the period of exposure, which appeared to have no significance.

TABLE V.

Results of Inoculation with B. Coli.

Series	Exposed Animals		Control Animals	
	Died	Survived	Died	Survived
1	13	0	12	0
2	13	0	11	2
3	6	1	4	3
4	10	0	10	0
5	9	2	10	1
6	6	2	3	5
7	9	1	7	3
8	5	5	7	3
9	7	2	8	1
10	0	5	0	5
Total	78	18	72	23

The treatment was rather severe, causing the death of three quarters of the inoculated animals. The fatal result occurred within 24 to 36 hours and was accompanied by a marked peritonitis. No increased susceptibility due to the putrid gases was apparent, the difference between the groups being so slight as to have no significance.

In Series XI–XV the animals were injected with a more accurately standardized inoculum, a sublethal dose of diphtheria toxin. This toxin was courteously furnished to us by Dr. A. P. Hitchens of the H. K. Mulford Company. Its minimum lethal dose was determined as .005 cc. for a 250 gram guinea pig and in all of our experiments .004 cc. was used, injected subcutaneously.

In Series XI, XIII, XIV, and XV the injection was made at the completion of the experiment, after 16 days, 4 days, 5 days and 6 days, respectively. In Series XII half of the animals were injected after 7 days and the rest after 15 days.

TABLE VI.

Results of Injection with Diphtheria Toxin.

Series	Exposed Animals		Control Animals	
	Died	Survived	Died	Survived
11	1	7	3	5
12	2	7	1	8
13	1	5	3	3
14	2	5	1	6
15	0	5	1	4
Total	6	29	9	26

Of the fifteen animals which succumbed, eleven showed definite symptoms of diphtheria intoxication, with engorgement of the adrenal glands and marked hemorrhagic gelatinous edema at the site of inoculation. Death resulted in from 4 to 9 days, usually in 4 to 6 days. Three of the animals died of pneumonia and in one case the picture was doubtful. It was evident that the putrefactive odors had no harmful effect, the death-rate being slightly higher among the control animals.

Summary and Conclusions.

1. Our experiments with guinea pigs exposed to putrefactive odors from moist feces do not indicate that such exposure has any influence upon the resistance of these animals to sublethal inoculations with colon bacilli or to sublethal injections of diphtheria toxin. There seems no particular reason to expect any such influence, except for the remarkable results reported by Alessi. It was the desire to repeat and verify his observations which dictated the technique of our experiments; and our results entirely fail to substantiate Alessi's claims of a reduction in resistance against bacterial inoculation. Our experiments have no direct bearing upon the work of Puntoni who studied the effect of putrid gases

primarily upon the intestinal flora and the resistance of the intestinal wall; but the conditions with which Puntoni worked were so extreme that they do not appear of special interest from a practical standpoint.

2. On the other hand we find that the odors from moist feces do have a real, although slight and transitory, influence upon the growth curve of guinea pigs. For the first week of exposure, animals breathing such gases gain in weight less rapidly than normal controls. Later they become accustomed to the odors and grow as rapidly as the controls, indeed tending to catch up with them in weight by the end of the second week. The difference between these results and those reported by Delépine may most probably be explained by the fact that gases of putrefaction must have been in much lower concentration in his experiments, although the number of animals used by him was in any case perhaps too small to reveal such slight differences as we have found. Our results may probably be considered to be analogous to those reported by the New York State Commission on Ventilation in regard to the effect of stale air upon the appetite of human beings.

3. Finally it may be concluded that the effect of putrefactive odors upon resistance to disease remains unproven (unless they are present in such extreme concentration as to be directly toxic, as in Puntoni's experiments). It does appear, however, that such gases may exert a real but transitory effect upon the appetite for food in human beings, and upon the growth curve of guinea pigs, an effect which in each case tends to disappear as the subjects become accustomed to the odors in question.

THE USE OF INFLUENZA VACCINE IN THE PRESENT EPIDEMIC.

By Timothy Leary, M. D.

Continued from page 754.

these reasons the objections which are made to the use of vaccines in the treatment of septicemias do not hold in the pneumonias of the present epidemic.

Each injection of vaccine should be made into a new muscle group. It is the belief of the writer that the muscles are important producers of immune substances. In no other way is it possible to explain the rarity of bacterial infection of muscles, even when the viscera, blood and lymphatic systems show deep infections. In a local disease, limited as this is to the respiratory system, it should be possible theoretically to awaken the muscle groups to an activity, which they do not exhibit in response to an infection in which the organisms are localized in one part of the body.

Vaccine treatment is not recommended in moribund cases with massive pneumonias and cyanosis. Unlike antitoxins, vaccines require reacting ability on the part of the patient.

SUGGESTED MODIFICATIONS OF THE STANDARD METHOD FOR THE STUDY OF THE DUST CONTENT OF AIR.

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To be read before the Laboratory Section, American Public Health Association, December 9-12, 1918, at Chicago, Ill.

IN the final report of the Committee on Standard Methods for the Examination of Air of the American Public Health Association[1] the use of the Palmer Water Spray apparatus[2] was recommended as a method for the examination of dust in air, and it was adopted by the Association at the Cincinnati Meeting in October, 1916. The Laboratory of Hygiene of the University of Pennsylvania and the Clinic for Diseases of Occupation of the University Hospital have been employing this apparatus in an extended investigation of the problem of dust in industry, and have found it to be very satisfactory in use and to yield most interesting and instructive findings. We have followed the directions of the standard methods as to collection of samples and preparation for counting, but have used a decidedly different scale of size classification of particles which we feel has distinct advantages over that suggested by Palmer and his colleagues.[3] Their directions call for five classes based on the area of the particles as compared with the standard unit or smallest ruled square in the Sedgwick Rafter eye piece: Class 1, Large masses, about 100 standard units (.04 sq. mm.); Class 2, About 25 standard units (.01 sq. mm.); Class 3, About 1 standard unit (.0004 sq. mm.); Class 4, About $\frac{1}{4}$ standard unit (.00014 sq. mm.); Class 5, Dust too fine to count—presence indicated by a plus sign.

Dust particles as observed by us are so extremely irregular in outline, especially fibrous vegetable dust and spicular crystalline mineral dusts, that we find it extremely difficult to estimate the area without taking two or three measurements of each particle and feel that such estimates are very inaccurate and do not convey a true idea of mass, as the third dimension is entirely disregarded. On the other hand, a grouping based on the length of the greatest diameter is comparatively easy and while this excludes two dimensions, yet we feel that its greater opportunity for precision possibly balances the absence of the second measurement, and it certainly very greatly simplifies the counting. Therefore we at first adopted a grouping into four classes with average greatest diameter of .04 mm., .01., .004 mm. and .001 mm.; the diameter of the first four classes in the standard grouping will be 2.1, .02 and .01 mm., including much larger particles than our count and grouping our two smaller classes together as uncountable. While it is impossible to determine the area of these minute particles yet with proper dilution they are certainly countable. We grouped in our Class 4 all particles seen as mere dots too small to determine outline, and in our Class 3 minute particles too small to estimate area, yet showing definite form. Our tests show that these two classes together make up from 80 to 94 per cent of the total count in the average of different industries. In only nine instances in organic dusts did the together go below 80 per cent, in one case falling to 63 per cent, and in only five mineral dusts going below 80 per cent, the lowest being 74 per cent. As we

have made 70 tests in all, 28 in mineral dusts in eleven factories in five industries, 37 in organic dusts in eleven factories in six industries, and five tests of non-industrial dusts, we feel that our results must be fairly representative. We have excluded the larger particles of Classes 1 and 2 of the standard method as they are usually too heavy to pass the nasal passages even if they do enter the nares, and, as the counts published by Palmer and his co-workers show, they never include more than 3 per cent of their counts and often none. Our four classes, while excluding the largest particles counted by Palmer, *et. al.*, include a wide range of sizes, our largest being forty times the diameter of the smallest as against twenty in their range, and, by having greater intervals between average sizes, facilitate grouping. Class 4 of standard methods corresponds with our Class 2 and that is where Palmer, Coleman and Ward[3] place most of their particles. Their total counts per cubic foot exceed the range of ours, ours ranging from 24,400 in the out-door air on a very quiet day, near an oiled road, to over 15,000,000 in a coal-crushing room of a cement factory, their range being 23,000 at the fifty-eighth floor of the Woolworth building and 48,000,000 in an iron-grinding room. We assume from this that they have not made as careful estimates of the smaller sizes, or have grouped all particles below .0001 sq. mm. and still countable in their Class 4. Our exclusion of larger particles facilitates the counting of fibrous dusts, and certainly long fibres are least likely to prove a factor in lung damage. Our tests were made with double distilled water filtered through a Berkefeld candle to exclude all suspended matter. To still further simplify counting, our Classes 2 and 3 might be grouped together, thus giving but three classes, Class 1 averaging .04 mm. in diameter and easily distinguished, Class 3 very minute visible but unmeasurable particles, and Class 2 all falling between these extremes, and we will use this latter grouping tentatively in future.

Table I gives a summary of our tests. Details of the tests in cigar factories have already been published[4] and the rest of the work appeared in a separate article.[5] The sizes of our classes are purely arbitrary and were originally based on a wrong reading of the article by Palmer, Coleman and Ward, but as they were found to work out so well in practice and as the work was started on that basis they were continued through the entire series of tests. Measurements made on a microphotograph of coal tend to confirm this relative size distribution.

We also deviated from Palmer's practice in the determination of solids, as it was found more convenient to evaporate to dryness 50 cc. of sample, usually representing 100 cubic feet of air, in a weighed porcelain capsule, cool in a dessicator, weigh, incinerate and again weigh and so determine total solids with percentage of mineral and organic matter. The residue from 50 cc. of double distilled filtered water is practically negligible and can be disregarded. We report our solids per 100 cubic feet, requiring no conversion factor.

Conclusions.

We would suggest, as the result of six months' work comprising seventy tests in a great variety of dusty atmospheres, that the standard method be modified by eliminating the two larger sized classes and counting Class 3 in one or two divisions which we feel are countable without great difficulty.

We would suggest that the sizes be based on the length of the greatest diameter rather than the area, as being much easier to determine and probably giving equally satisfactory results. The

classes we have used are .04, .01, .004 and .001 mm., and those we suggest in future are .04, .004,–.01 and .001.

We would suggest the reporting of solids per 100 cubic feet rather than per million liters and the determination of percentage of mineral and organic matter therein.

With the above modification we find the Palmer apparatus used by the standard method gives reliable and valuable information as to the amount and character of the dust in the air.

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4. Smyth, H. F., and Miller, T. G. 1917. A Hygienic Survey of Cigar Manufacturing in Philadelphia, Medicine and Surgery, Vol. L., 698.

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TABLE I.

Summary of the Averages of the Dust Tests with General Averages for the Organic and Inorganic Groups and for the Standards.

Inorganic Group.

Industry	Number of Tests	Particles					Weight	
		Number per Cubic Foot	Percentage Distribution According to Size				Per 100 Cu. Ft. in Grams	Per cent Inorganic
			.04 mm.	.01 mm.	.004 mm.	.001 mm.		
Cement	11 (2)	6,790,900	3	11 (37) 26	60		0.2185	72
Flint	3 (2)	844,040	4	9 (31) 22	65		0.0459	76
Steel grinding	3 (2)	578,100	7	11 (28) 17	65		0.0483	96
Asbestos	6 (2)	494,130	4	11 (39) 28	57		0.0327	73
Pottery	5 (3)	182,720	5	10 (34) 24	61		0.0130	60
Average	28 (11)	1,777,970	4	11 (37) 26	59		0.0717	76

Organic Group.

Blanket Plush and Carpet	13 (3)	148,950	11	8 (24) 16	65		0.0504	27
Felt hat	3 (1)	126,020	4	7 (33) 26	63		0.0168	39
Cigar	19 (6)	102,600	6	14 (47) 33	47		0.0085	56
Silk	2 (1)	87,000	3	7 (21) 14	76		0.0045	49
Average	37 (11)	116,190	6	9 (31) 22	63		0.0201	42

Standard Group.

Location:								
Outdoor	2 (2)	34,000	3	8 (32) 24	65		0.0069	
Indoors	3 (2)	99,600	1	7 (29) 22	69		0.0114	66
Average	5 (4)	66,800	2	7 (29) 22	69		.0098	66

Note. Figures in parentheses in second column indicate number of factories. Figures in parentheses in percentage column give the results of combining the second and third groups as suggested.

CHLORINATION OF CHICAGO'S WATER SUPPLY.

JOHN ERICSON, C. E.,
City Engineer, Chicago, Ill.

To be read before the Sanitary Engineering Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

CHICAGO has always been liberal in the quantity of water supplied her people and her varied industries. At the present time, notwithstanding continued efforts at conservation, necessitated by reason of unwarranted preventable leakage and waste, the amount of water supplied per capita and in total is greater than the amount supplied by any of the greater water works systems in the world.

There is an inexhaustible body of water close at hand, and the greater part of the city streets is less than twenty feet above the surface of the Lake. To the average non-technical mind no convincing reason has been recognized or accepted why the quantity of water supplied to the people should not be unlimited, and, therefore, the per capita, as well as the total quantity of water pumped at the city's pumping stations has steadily increased, the present daily per capita pumpage being about 260 gallons and the average daily pumpage from 638 to 740 million gallons, varying with the season and weather conditions.

SANITARY EFFORTS.

Efforts have continually been made by the municipality to safeguard the purity of the water supply, by locating intakes miles from shore and by the construction of intercepting sewers and the Sanitary District Channel, by which the flow of the sewage-laden Chicago River has been reversed, thus diverting the greatest part of the city's sewage away from Lake Michigan, the source of our water supply. Some portions just north and also the southern part of the city still discharge sewage-laden water into the Lake. Work is now in progress, however, under the direction of the Sanitary District of Chicago, which will also soon divert the sewage of these sections; on the north by the construction of intercepting sewers and a pumping station in the city of Evanston which will divert to the North Branch Channel, and on the south by the construction of the Calumet Sag Channel with necessary auxiliaries which will carry into the Main Drainage Channel the polluted waters from these districts.

The disposal of dredgings from the Chicago River into the Lake, as well as the navigation of large passenger steamers, will, however, be more or less a source of pollution as long as it exists.

The beaches along the shores of Lake Michigan are being used to a largely increasing extent for bathing purposes in the summer months. These and other reasons made apparent the necessity for further efforts towards the conserving of the purity of the water supply.

CHLORINATION.

Filtration of the Chicago water supply being a gigantic problem, treatment of the water by the hypochlorite of lime method was tried experimentally early in 1912 at the Edward F. Dunne intake crib, supplying the Roseland Pumping Station. In July, 1912, this treatment was extended to the 68th Street Crib, supplying the large pumping station located at 68th Street and Oglesby Avenue. In August, 1913, a similar experimental plant was also placed in operation at the Lake View Intake Crib.

Many difficulties were encountered with these installations. During cold weather the freezing of the solutions in tanks and pipes, the blocking up of the distribution pipes by anchor ice, and difficulty in the delivery of hypochlorite to the cribs caused periodical shut-downs of the plants. There were also many complaints by consumers on account of a disagreeable taste to the water.

LIQUID CHLORINE.

As liquid anhydrous chlorine had been used with apparent success in various places and apparatus for its use for water sterilization purposes had been developed to a point where the city was justified in taking up the

matter seriously, an installation for trial and experimentation was made.

Two liquid chlorine apparatus, made up by using a modified acetylene gas reducing valve combination purchased from a Chicago manufacturer, were temporarily installed and connected to the intake of the 68th Street Crib. These apparatus were installed for the purpose of making tests of the feeding and regulation of dry chlorine gas, to secure data on the effect of temperature on the flow of gas, to test the effect of the gas on feed pipes and fittings of various materials, and to secure other valuable information.

The machines were operated by the regular employees of the crib under the direction of the City Engineer.

After this experimental work machines for the administration of liquid chlorine were installed in all of the city's pumping stations.

The dates on which the machines were placed in service at the various stations are as follows:

Chicago Avenue, September 6, 1916.
Twenty-second Street, December 15, 1915 (for temporary service, test and adjustment).
Twenty-second Street, January 4, 1916 (permanent).
Sixty-eighth Street, March 4, 1916 (temporary).
Sixty-eighth Street, July 1, 1916 (permanent).
Lake View, April 4, 1916.
Roseland, July 10, 1916.
Fourteenth Street, August 24, 1916.
Harrison Street, August 26, 1916.
Central Park Avenue, September 27, 1916.
Springfield Avenue, October 6, 1916.

The new equipment was comprised, with one or two exceptions, of the Electro Bleaching Gas Company's Model C, manually controlled apparatus, consisting essentially of manifolds to which the required number of cylinders may be connected, regulating and controlling valves, high and low pressure indicating gauges, a meter to indicate the rate of flow of chlorine gas, and a so-called absorption tower into which the chlorine gas and a small stream of water are introduced in such a way that the water will absorb the chlorine gas and flow to the point of application of either the common suction well of several pumping engines or the suction pipe of an individual engine.

The installation of the chlorine controlling apparatus in the different stations has been varied to suit local conditions. In general, each installation was placed in a well sealed half glass wooden booth or enclosure provided with heating coil or radiator and an indicating thermometer in order to maintain proper conditions of temperature and dryness.

An electric motor-driven ventilating fan with intake connected by copper suction pipe, with its opening near the floor of the booth, was installed in each place to remove the chlorine gas which might escape. The motor control switch was placed outside the booth to permit ventilation before the booth is entered.

The maintenance of this apparatus, with its many delicate devices, in proper service operation has been a difficult matter, notwithstanding all the precautions which have been taken to prevent leaks, breakdowns, etc. The regular station employees had to be slowly trained in the handling and care of the apparatus. When a man had become somewhat familiar with its use, call to war service or absence of such men on vacations made substitutes necessary, and this more or less aggravated the situation.

Chlorine gas is a very difficult substance to handle. Material of parts which pass through all tests under air, steam or water frequently proves porous or imperfect when subjected to chlorine gas. The city has been fortunate in having its own shops and foundry, which has enabled it to keep the apparatus in continuous operation, which would have been practically impossible if we had been obliged to depend entirely upon the manufacturer for repair service.

The apparatus now in use in the older stations is unquestionably capable of considerable improvements, particularly along lines which will eliminate numerous delicate parts, joints and valves, and that will give a more dependable distribution of the amount of chlorine to be fed to the water.

A step in this direction has been taken by the city in connection with the new Mayfair Pumping Station, located in the northwestern part of the city, and which was placed in service in August of this year.

This station contains five triple expansion pumping engines of the plunger type with a combined capacity of 110 million gallons per day. The ultimate capacity of the station will be about 152 million gallons.

The water is supplied to these pumps through a tunnel with the intake three miles from shore. From the main shaft at the pumping station, which is located five miles west of the lake shore, the water is distributed to the pumps through two branch tunnels connecting at a higher elevation with the main shaft located in front of the station.

Thus all the water which is pumped at the Mayfair Pumping Station has to come up through this main shaft, and it was selected as the most suitable and effective point to apply the chlorination. The pipes conducting the chlorine solution into the water as it rises from the tunnel through the main shaft extend fifty-five feet below the horizontal branch tunnels, thus giving the chlorine as much time as practicable to act on the water before it enters the pumps.

The chlorine apparatus of the Mayfair Station consists of two complete and independent sets, so that in case or a breakdown of one of them the other may be thrown into use very quickly.

Each unit consists of a group of a battery of nine (9) chlorine cylinders connected with suitable tubing to the manifold receiver where the pressures from the various chlorine cylinders are equalized. From this manifold receiver the gaseous chlorine passes into a so-called *Ærisostat*, a chamber that regulates the quantity of chlorine required and wherein the pressure is reduced sufficiently to just drive the chlorine gas through the wrought iron piping into a room constructed over the main shaft and the floor of which is seven feet above low lake level.

In this room are situated two sets of two mixing towers providing for the reception of four ¾-inch chlorine pipes. These mixing towers are seven feet high and are filled with pumice stone; they are made of hard rubber and are eight inches in diameter. One of the chlorine pipes enters each mixing tower from the top and extends to within six inches of the bottom. It is covered with a copper spraying cone into which during operation a stream of filtered water falls, which, by gravity, works down through the pumice stone in the mixing tower. The chlorine gas in rising in this same enclosure is absorbed by the water, thus forming the real chlorinating solution.

From the bottom of the mixing tower extends a hard rubber pipe one inch in diameter connected to a 1¼-inch inside diameter rubber hose through which the chlorine solution finds its way into the raw water at about an elevation of ninety feet below low lake level or datum. This hose is protected by a two-inch extra heavy galvanized iron pipe anchored to the walls of the shaft. This describes in a very brief and general way how the chlorine is administered to the raw water.

The regulating and pressure reducing part of the apparatus called the *Ærisostat* differs in principle from the other installations. It is simple and compact, and from months of trial it promises to greatly reduce the cost of maintenance and to insure a more accurate distribution of the chlorine gas.

A detail description of this apparatus cannot be taken into consideration in the scope of this paper, but the general principles on which it is designed are as follows:

The chlorine regulator or *Ærisostat* is essentially low pressure float-controlled chambers, based on the principle of a U-tube with legs of different areas proportioned to equalize the effect of the higher pressure of the chlorine cylinders and the low pressure required for the delivery of the gas to the absorption tower or other point of delivery.

The main chamber of the regulator is divided into two parts of proportionate areas by a partition extending downwards to within a certain distance of the bottom. This chamber is nearly filled with pure sulphuric acid. Chlorine gas from the cylinders is admitted to a circular opening in the top of the chamber, the underside of which opening forms a seat for a vertical needle valve. As soon as gas is admitted through this valve into the larger part of the chamber the pressure of the gas upon the sulphuric acid in the larger chamber forces the liquid up into the smaller one. A float in this chamber is connected to the vertical needle valve by levers and rods in such a

manner that it controls the opening and closing of the valve, as the pressure of the gas causes the fluid to rise or fall in the smaller chamber. This regulation in the older apparatus is obtained by two or more frail reducing valves of the diaphragm type with counter acting springs. These required close watching and attention to keep the same in operating condition.

The chlorine platforms and accessories are enclosed in partitions of steel and glass, isolating the installation from the pump room. An electrically operated exhaust fan ventilates the enclosure driving the exhaust air out through an opening in the roof of the gate shaft. A red pilot light indicates from a distance when the fan is operating. The ventilating conduit is a six-inch diameter No. 16 gauge copper pipe. Provision for heating has been made so as to keep the temperature within the enclosure between 90° and 95° F., and in the main shaft the temperature should not go below freezing point. The temperature is controlled by thermostats.

It is important that the amount of chlorine used be accurately determined, and as a check on the distributing apparatus two dial reading chlorine weight indicators are installed. The weighing platforms are inside the enclosure, but indicators are placed outside. The pointers are so arranged as to show directly the number of pounds of chlorine used. The recording gauges showing the pumpage of the water, as well as those showing the dosing by chlorine, give an accurate account of the proportion of chlorine used to the water pumped. It would, however, be far more desirable if a satisfactory means can be introduced which will automatically regulate the amount of gas used in a definite proportion to the pumpage. This seems feasible with a Venturi meter when used to record the flow of water, as it may be connected to the apparatus controlling the flow of chlorine automatically increasing the flow of gas as the pumpage increases, and vice versa. This problem will be given attention.

The most modern apparatus and all improvements which past installations have suggested are made use of at the Mayfair Station.

It would seem, however, that considerably more experimental work will have to be done with the mechanical devices and that the analyses of the chemical activities of the gas be made as may be required under various conditions. A special study of the chlorine plant at this station will be made with a view of future improvements.

Chlorination for the sterilization of water for domestic purposes is evidently a correct principle, judging by our experience so far. The results obtained in Chicago since complete chlorination has been in vogue seem to bear this out.

The bacteriological tests made on untreated water during 1916 showed colon present in one cc. in 18 samples out of 1,000 examined, whereas the corresponding number of contaminated samples in treated water during the first nine months of 1917 was nine-tenths or less than one per 1,000 samples examined.

During the first nine months following complete chlorination of the water supply the death-rate from typhoid fever was reduced by 71.44 per cent. There is, therefore, a strong indication that the use of chlorine reduced the death-rate due to typhoid fever more than 70 per cent.

It is our duty, however, to further investigate and to experiment intelligently and scientifically for the purpose of constantly improving our methods with a view of providing mankind with a pure and wholesome water free from injurious substances.

The Department of Health is exercising a close supervision over the chlorination of the water supply in Chicago, and to this supervision can to a large extent be ascribed the gratifying results obtained.

I have taken it for granted that some representative of the Health Department will furnish you with detail statistics illustrating more fully these results.

BIRTH REGISTRATION IN CONNECTICUT.

JAMES P. BALFE,
Director, Bureau of Vital Statistics, State Department of Health, Hartford, Conn.

To be read before the Vital Statistics Section, American Public Health Association, December 9–12, 1918, at Chicago.

THE development of birth registration in Connecticut is of peculiar interest because this commonwealth was among the first to recognize the importance of the subject and to enact legislation covering it. As early as 1644, it was "ordered that the Town Clarkes or Registrars in the seueral townes within his jurisdiction, shall ech of them keepe a record of the day of mariedge of euery person maried w'thin theise libertyes, and of the day of the birth of euery child hereafter borne, to who the parent of the child shall w'thin three days after the birth of his child certifie the day of the child's birth, and to who euery man that shall be maried shall w'thin three days after his mariedge certifie his mariedge day under the penalty of five shillings euery default."

Not sufficient record or statistics are now available by which we can judge the success which attended this pioneer effort to make birth registration compulsory. It is notable, however, that this crude law put the burden of registration upon the parent.

During the period of nearly three hundred years since those Colonial days, laws relating to this subject have been continuously a part of the statutes of Connecticut. That none of them has been completely satisfactory is evidenced by the fact that there have been frequent amendments to the law, most of which relate to the methods by which the desired information was to be secured and recorded.

In 1848, Connecticut published its first report on vital statistics. Since then, with the exception of the year 1852, annual statements on the subject have been printed by the state. In the Acts of 1852 it was provided that every town at its every annual meeting appoint a registrar, who was required to keep a record of vital statistics and, once a year, to send abstracts to the Secretary of State, by whom they were published. In 1854, the General Assembly directed the State Librarian to make a report relating to births, marriages and deaths.

In his annual report for 1863, the State Librarian wrote: "The value of a thorough registration will be felt now more than ever in consequence of the war, not only in settlement cases, but in applications for pensions and bounty lands by the widows and orphans of those who are laying down their lives in efforts to maintain the laws of the land and the unity of our country; and, as the Secretary of Rhode Island remarks, had our present system of registration of births, marriages and deaths been in operation during the War of the Revolution and that of 1812, some hundreds of thousands of dollars would have been saved to the people of this state, and hundreds of families, which for years struggled with adversity, would have been made comfortable during their lives."

It might appear from this quotation that the system in vogue at that time approached perfection. Nevertheless, when the State Board of Health was organized in 1878 and the Secretary of the Board made Superintendent of Vital Statistics, it was found that many towns made no returns whatever. In some instances registrars had not been appointed and there were no officials to collect and record the necessary data. Dr. Chamberlain, the first secretary of the Board of Health, made every effort to improve conditions; but he discovered that no adequate means had been provided for the enforcement of the law. It was nobody's duty to see that it was obeyed. The following quotation from one of Dr. Chamberlain's early reports sounds strangely familiar to one who follows the present nation-wide agitation for complete birth registration:

"The town registrar might treat a return which omits to give information on the points required as a nullity and proceed to collect the information himself and receive the fee therefor. Although it is made the duty of registrars to amend their records from time to time, this is done to but a small extent, however well-disposed the registrar may be. In places where he cannot be personally ac-

quainted with all the families residing in his town, it is impracticable to obtain the names without a thorough canvass of the town. Some method certainly ought to be devised to remedy this defect which will seriously impair the future value of these records.

"The importance of complete registration in regard to all questions of heredity and descent are too obvious to need comment; and the value of such records increases as the country grows older and other sources of information less readily obtainable. That the births are not all recorded requires only a glance at the comparative population and birth-rates of our cities and towns. The relations of complete registration to claims for pensions, legal settlements, annuities and insurance are too extensive to be more than hinted at in this connection. The laws of the state are such that it only requires individual effort to secure better registration than any other state in the Union."

And this was written in 1878!

In 1893 the legislature passed an act providing for the appointment of a county health officer in each of the eight counties of the state. It was stipu'ated that each health officer should be an attorney-at-law, and he was empowered to cause the execution of the laws relating to public health and the registration of vital statistics. It was believed that their training and experience would enable them to appreciate the value of correct records and to maintain a systematic inspection of the conditions of registration in all towns. These expectations were not realized. Public indifference and the negligence and, often, the open contempt of professional attendants had the usual tendency to discourage zealous officials.

New legislation in 1917 abolished the State Board of Health and created the State Department of Health. The executive officer of this department is the Health Commissioner. Acting under him are various directors, each vested with full authority and responsibility in his particular branch of the work. All matters relating to the registration of births, marriages and deaths come under the immediate supervision of the Director of Vital Statistics. This functionary is concerned with no other work of the department; and it is believed that by thus centralizing the authority and duties necessary for this work much better results may be obtained than seems possible where the responsibility is divided or the work made incidental to other duties.

Our present statute governing the collection of vital statistics requires every physician or midwife who shall have professional charge of a mother at the birth of any child, and every person who shall act as midwife at such a time, when no physician is employed, to file with the town registrar five days after the event occurs, a certificate of birth, signed by such physician, midwife or attendant; and it further specifies the information which such certificate must contain. The same statute constitutes the town registrar the custodian of all vital records, and, in cases where the attendant fails to file a certificate of birth, the registrar is directed to secure the information himself. On or before the fifteenth day of every month, he is required to send to the State Department of Health an attested copy of every birth certificate filed with him during the next preceding month. The law carries a penalty of not more than $25 and not less than $7.

A recent survey of birth registration in Connecticut, conducted by the United States Census Bureau, under the direction of Dr. W. H. Davis, Chief Statistician of Vital Statistics, shows that a trifle more than 90 per cent of the births in the state are being reported. The tests of rural districts proved practically perfect, the deficiency occurring in the larger communities. In the most populous city of the state, it appears that fully 12 per cent of the births are not registered. This is accounted for by the fact that in our great industrial centers the percentage of foreign-born residents is very high. Among the Slavs and Italians it is common to dispense with the services of a professional attendant at childbirth. When the event is about to occur they call in an unlicensed woman who not only assists the mother at the birth, but also takes full charge of the household until the mother is up and around, receiving a very modest fee for her work. It has been established that about 85 per cent of our unreported births result from this custom. The attendant will not report

for fear of prosecution for practising without a license, and the parent is reluctant to report through fear of involving the attendant.

No provision is made for reporting births where professional attendance is lacking, other than the statutory requirement that registrars must ascertain all births occurring within their towns. In the larger towns, it is impracticable to expect the registrar to ascertain births except where obtained from the churches. The registrars of some towns are furnished lists of baptisms which have resulted in many hundreds of births being added to the records. The town registrars, almost without exception, fully realize the great importance of perfect birth registration, and considering the slight financial and moral support which they receive, this paper would not be complete without appreciative comment being made of their service.

A remedy for this condition might be found in an amendment to the law requiring the parent to file the certificate in the absence of a professional attendant and providing a penalty drastic enough to command respect.

Such an amendment will be proposed at our next General Assembly.

Another apparent defect in our statutes is the provision that all action on complaints for violations of the Vital Statistics law must originate with the county health officers. This places upon these officials an unnecessary and distasteful burden. Such a condition is always undesirable. It is my opinion that prosecutions should be handled by the State Department of Health through a State Prosecutor, acting upon complaint of the Director of Vital Statistics, who is the one official most interested in the correct and complete compilation of birth records. At the present time, when this official becomes cognizant of a violation of the law, he can go no further than to call the matter to the attention of the county health officer. The disadvantages of such a system are too obvious for comment. On the other hand, it is easy to visualize the moral effect, on chronic violators, of prosecution by an official who represents the impersonal and impartial power and authority of the commonwealth itself. As Frederic Bastiat, the great French publicist, once said, "the way to make a law respected is to make it respectable."

One of the chief difficulties of correct birth registration in Connecticut grows out of the cosmopolitan character of the state's population. Our great manufacturing industries attract labor of all nationalities. Many of our residents possess names which defy and humiliate the rules of English orthography. Where the parents are illiterate, the confusion of the professional attendant attempting to write out a birth certificate can be better imagined than described. In the case of many Slavic names, it would appear impossible ever to spell them phonetically without adding to our alphabet new characters representing a cough, a sneeze and a hiccough. Although our physicians and licensed midwives now rarely fail to file certificates of birth, it appears that they are frequently careless in the matter of spelling names. The tremendous demand for certified copies of birth certificates occasioned by the war and by legislation concerning child-labor, etc., has brought out the fact that about 35 per cent of all certificates thus requested have required correction.

With a view to stimulate better reporting, and to securing greater accuracy in the spelling of names, the Department of Health has recently adopted the plan of sending to each mother an engraved record of her child's birth, signed in facsimile by the Governor of the State, Hon. Marcus H. Holcomb, and the Health Commissioner, Dr. John T. Black. It contains the child's name, the place and date of birth, the father's name and the mother's maiden name. This is sent as soon as the birth has been certified to the department by the town registrar. Accompanying it is a request that if the names and data are incorrect, the department be notified immediately and the corrections will be made. The plan has been adopted too recently for us to judge its effectiveness, but it is hoped that it will reduce the errors in our permanent records as well as incite greater care on the part of those charged with the duty of filing the original certificates. It is also hoped that a general demand may be created for the little record itself.

From this brief outline of the general conditions surrounding birth registration in Connecticut, it will be seen that the difficulties and problems presented to our state authorities are not unlike those encountered elsewhere. While our legislation on the subject is not perfect, it is well to consider that laws themselves have their own limitations. After all, the great governing power of our time is public sentiment. A law deprived of that power becomes a dead letter. Backed by it, an imperfect law may secure practically perfect results. Complete registration will never be secured until the demand for birth certificates becomes universal. The only incentive which will create such a demand is general recognition of the value of these certificates. When every parent understands the dangers arising from lack of registration, it may reasonably be expected that the results will be as nearly perfect as is humanly possible. It is this thought which has led our Department of Health to institute a thorough campaign of publicity with a view to impressing every parent with the idea that one of the first legal rights of a new-born child is to have a certificate of his birth properly executed, filed and preserved.

A paper of this character is naturally made up largely of individual opinion and experience; but it will bring before this body the fact that Connecticut is fully alive to the necessity as well as the advantages of complete and accurate birth registration. It requires such stirring times as the present to bring home to us the realization that each individual citizen represents a national asset and that the protection of his rights from infancy is as much a matter of sound business policy on the part of the state as it is a duty to the child himself.

◈

Statistics of Syphilis.—It appears from the figures in the following table that the usual estimates of the prevalence of syphilis (from 1 to 3 per cent) based on clinical methods of diagnosis are erroneous. Wassermann tests given to representative groups in a routine manner reveal that the per cent infected varies from 2 to 5 per cent among men students, 8 to 11 per cent among white workingmen, and from 15 to 20 per cent among the lower classes of whites and among negroes.

THE PREVALENCE OF SYPHILIS AS INDICATED BY RESULTS OF MEDICAL EXAMINATIONS OF EMPLOYEES, STUDENTS, ARMY RECRUITS AND OTHER REPRESENTATIVE GROUPS.

(Diagnosis based on Wassermann tests administered to all cases in regular routine or to individuals selected at random.)

	Number	Infected with Syphilis	
		Number	Per cent.
Cadets in West Point; males only (Vedder)	621	34	5.5
Students in University of Texas Medical School; males (McNeil)	50	..	0.0
Applicants for push-cart licenses examined by New York City Department of Health	1,117	91	8.4
Men in Tombs Prison (New York City) examined by New York City Department of Health	446	49	10.9
White recruits in U. S. Army (Vedder). Accepted recruits (no cases of known syphilis included, as all such cases discovered by examining physician by use of clinical methods had been rejected before tests were made)	1,019	171	16.8
All applicants (2.3 per cent rejected at recruiting stations because of diagnosis by clinical methods added to above; estimate by Vedder)	..	..	18.9
"Apparently healthy negroes" under treatment chiefly for accidents, Galveston, Texas (McNeil)	200	46	24.0
English workmen of "a somewhat superior artisan class" applying for positions requiring medical examination; adult males	500	46	9.2
Workmen treated in East London Hospital for accidents, wounds, etc., some friends visiting patients also included; all apparently healthy	1,002	84	8.3
Males	616	64	10.3
Females	386	20	5.1

—H. H. Hibbs, Jr., *Trans. VIII, Annual Meeting Amer. Ass'n for Study and Prevention of Infant Mortality*, 1917, p. 121. (*D. G.*)

REPORT OF THE COMMITTEE ON PRODUCTION AND CONSERVATION OF FOOD SUPPLIES.

To be read before the Food and Drugs Section, American Public Health Association, December 9–12, 1918, at Chicago, Ill.

WITH the constant energies of the Food Control Commissions of the several countries of the Allies being applied, and with the results of the labors of their recent extended joint Conference in London, it may seem almost superfluous for the Section on Foods and Drugs of the American Public Health Association to concern itself with such problems as the Conservation and Production of Foods.

It is something, however, to have had a section, which may be called a standing committee of the Association, to bring together such a symposium of scientific papers as were presented in Washington last year, and there can be no doubt but that this year again the main factors of the problem will be illustrated and its solution thereby advanced.

Essentially it is a problem always and first of increased production and of increased conservation of food. The Food Commission tells us that the saving of the consumption of wheat in the United States sent 85,000,000 bushels more to the Allies last year, or enough to feed an army of 1,000,000 men. We further learn that 10 per cent more winter wheat was sown in the autumn of 1917 in the United States, while Ontario in Canada had an acreage of 10,000,000 in grain in 1918, and the total increase of crop area in Canada in 1918 was 6,000,000 acres. England, France, and Italy all increased their crop acreage in 1918, and the British Prime Minister has stated that the spectre of famine in Allied countries has been laid.

Should it, however, seem to some that the food problems have been solved, it may be worth while referring to the fact, that for the great bulk of the workers in our communities at home, holding positions where wages are largely stationary, the incentive of increased fixed prices in aiding greater production has resulted in a situation which affects the nutrition of a large number of the children in cities in ways which can, even if measured by an infant death-rate, be but imperfectly estimated, since the effects will be extended into the growing years of hundreds of thousands of the children not only of the Allies in Europe, but of non-combatants in America. This may be illustrated by such facts as that stated with apparent authority, that in New York State, while usually there are about 17 per cent of the milch cows slaughtered annually, 31 per cent were slaughtered in 1916–1917. The Advisory Committee of Congress in May, 1918, further reported 2 per cent less total live stock in the United States in 1917, 20 per cent less hogs in Iowa and 3 per cent less milch cows.

Yet alongside this the statement (from a British trade paper) to the effect that there was such a glut of bacon in the Liverpool docks when 10,000 tons arrived in April for which there were insufficient cold storage facilities, that thousands of tons so deteriorated that they went to the soap factories, while the balance was recured with boracic and smoked. As a partial defence for this situation 'The Times' intimated that the real d fficulty lay in the lack of cold storage on ships. From the action taken by Allied Governments to regulate warehouses and cold storages by requiring monthly reports for the amount of produce on hand, it is evident that in the old methods of competitive transportation and storage we find one of the most serious problems, which in peace time as in war must be solved by common understanding or coöperation.

Hoarding to maintain high prices, if associated with decline in quality, has all the evil effects of waste through neglect to preserve perishable products, with the further ethical sin of selfishness to maintain abnormally high prices. It is equally apparent that the many millions of farm products forced upon the market through lack of facilities for their conservation through cold storage, drying or canning, may have so often depressed prices as to result in there being no profit whatever to the producer.

The loss of bacon at Liverpool has been al-

ready referred to, yet it may be further stated that £130,000,000 was the value of foods in cold storage annually in England before the war occurred. Nevertheless frequent losses even then resulted from insufficient cold storage and refrigerator cars, as seen from the fact that there were even in 1918 only 2,000 refrigerator cars in Great Britain of but five tons capacity each. The organization of the Ministry of Food in England has been, however, of much value in distributing food. Every town goes by a number and has a call indicator and central office in which is entered daily the amount of each commodity then for sale. There are six districts in Great Britain each having a daily code indicating the food available in the district. The amounts are sent to the central office by 11 a. m. daily, so that space for the same in the war area can be arranged for.

A rather remarkable illustration of the influence of the organized wholesale dealers in foods, as cold storage men, shipping companies, forwarders abroad, etc., is seen in the fact that the Director of Ministry of Foods in England has stated that the great corporations determined the policy of the Department and opposed the creation of great cold storages at Liverpool and Glasgow, on the ground that, after as before the war, the various shipping companies would have cargoes arrive at the various seaports of the east as well as the west coasts and that an expenditure of capital in new warehouses would seriously affect these existing interests.

While such illustrations as that just given indicate the influence which organized trade has had, and still has, over production and conservation of foods, yet the activities of Governments as that of the Ministry of Food in England and that of the appointment of Food Controllers in the United States and in Canada, and their action in the matter of taking over the control of packing houses, of the distribution of various classes of foods, and of regulating the use of various food materials, all indicate the essential need that exists always, but is accentuated in war time, for not only the intelligent investigation of the problem by national Food Controllers throughout the world, but also the application of the knowledge thus gained to attain the most desired end, namely the production and conservation of those classes of foods most essential for the development and maintenance of human life.

It is apparent that the suggestion of any such scheme would in peace time have been looked upon as largely quixotic in the modern world, where competition has been deified as the only object of worship in trade worthy of general consideration. If, however, the world war is to teach the nations anything, then it becomes apparent that something better than the *laissez faire* pre-war system of trade competition ought to be the outcome of the infinite strain borne by millions of the human race struggling for subsistence. If it is possible for the members of the Food Boards to sit together in London and calmly discuss the means by which adequate quantities of the proper foods can be supplied where needed to all the nations of the Allies, it ought surely to be possible in time of peace for such nations to continue the goodwill and coöperation so established in the interests of the hundreds of millions of their wage-earners and consumers including the soldiers who have been fighting for their liberties.

The more the outcome of the combined energies of the Allied nations is studied and investigated, the more apparent does it become that human energy, intelligently and scientifically applied, is more than sufficient to produce with the favoring influences of sunshine and climate, food enough and to spare for all the dwellers on the earth. Taking our own continent as an illustration, we see how at the time when the proportion of urban population to the total was not more than 15 per cent and when cargoes to a country only three thousand miles away were carried on slow-sailing ships, such calamities as the Irish famine of 1845–7 were always within the range of possibilities. On the other hand we see today that with millions of men removed from production to the ranks of the army and with urban population making up more than one-half the total population, intelligence and energy by utilizing machinery is producing such enormous crops as even to make it possible for the Premier of Great Britain to say that

industrial England can this year supply two thirds of her own food needs.

When viewed closely, however, the complexity of agricultural and industrial development in connection with the world trade appears to grow greater with every year, along with ever-increasing diversity of occupation and ever-growing opportunities for the investment of capital, which we may call the surplus product of labor. We are told, for instance, that machinery is increasing the possibilities of agricultural production by at least five times. This is associated directly with the fact of the enormous influx of rural and immigrant population to our cities to engage in all the diverse industries which modern civilization has brought about. What is apparent, however, is that the close relationship between these two facts is only slowly being recognized; while the industrial interdependence between the producer of food and the consumer and the essential need for national and international energies being devoted to these ends is apparent.

The first stage to this end manifestly is the application of scientific experimental methods to every agency involved in agricultural production, followed by the preparation of raw products for food, both in the matter of their conservation and their cheap transportation. Probably no better illustration of this can be given than the recent practice of the strawberry growers and jam manufacturers of the Southern States in treating the surplus strawberries on the plantation with an equal weight of sugar and then loading them on refrigerator cars when they are sent to a cold storage until needed by the factory. If the capacity for production is being so greatly increased, then it does seem evident that the necessity for the long hours of labor, which farming has demanded in the past, ought to be notably lessened thereby supplying leisure and opportunity for the cultivation of more social amenities on the part of the agriculturist.

When, however, it is realized that it is not more than fifty years since slavery was abolished in Russia and that in many of the continental states of Europe even today, the rights of the peasantry have been of the most nominal character when compared with the advantages held by the landowners, and when we see in America the great body of immigrants, without capital yet with abundant land to cultivate, while greatly improving their past position, still remaining largely isolated in their communities and unable to take advantage commercially of the results of their labors through the proper marketing of their products, it must become apparent that the problem of food production, distribution, and consumption in the best interests of every member of the community will continue to remain after the war a problem very far from final solution.

Some idea of what is being accomplished may, however, be gained from various illustrations. In Sweden during the past thirty years associations have been formed for cooperation and are known as the National Union of Provincial Societies and Local Associations. There are over one thousand *locals* which receive orders and conclude transactions either directly with traders or through the National Union. The fundamental principle is the supply of goods at the market price of the day and the distribution of the profits among the purchasers of each. Later almost all the needs of the farmers have been supplied through such associations while all the technical facilities of modern agriculture are similarly placed at the disposal of the growers with technical help, especially to small farmers in producing and marketing their products. With the lessened number of laborers there has resulted an increased wage rate and an increase in the use of machinery. Unfortunately, too, the cost of production has exceeded the proportionate increase in the price of products, which naturally is regulated by competition in world markets with produce elsewhere.

It is interesting to note that some of these socialized methods of assisting production by assisting agriculturists on this continent are seen in Federal legislation at Washington for Farm Credits establishing banks, as well as in several Provinces of Canada, while Canada has passed an act to inspect and regulate stock yards. In California, in 1915, legislation was passed to develop and regulate the state-marketing of products. An officer of markets

and organization was appointed by the State whose duties especially include the investigation of:

1. Demand, prices, and amount in value of crops and the amount of cold storage.

2. Methods of coöperation, organization and relations between producer, consumer, and distributor.

3. Gradual establishing of standards as to quality, methods of handling, etc.

4. Investigating the practices of commission men.

5. Survey of quantity, quality, and value of products for owners.

6. Sending out advice as to points of distribution.

7. Improving the extent of this distribution and sale of farm products.

8. Reducing the cost of production, lessening the price to the consumer, and increasing the value to the producer.

9. Cultivating an interest in the coöperation of the three interests, producer, commission man and consumer.

But while we naturally direct our attention to the great problems of the production and distribution of foods, such as wheat and other staples, yet the application of those biological processes, based especially on the knowledge gained through the labors of Pasteur, Toussaint and others as chemists and bacteriologists must appeal with peculiar force to the Food and Drugs Section of a scientific association such as this. A single illustration has already been given of how the strawberry, one of the most delicious yet most perishable of fruits, is made available for consumption in the most distant markets by the application of the two processes of cold storage and canning. Today both these are being applied directly to the conservation of those other most perishable but essential foods, milk and eggs. Cold enables such to be taken to the factory where sterilizing or drying both serve to make them available as food for ships, at the war front or in the lumber or mining camps in regions far distant from the source of supply.

As regards the supply of fish, nothing has been more remarkable than the development especially on this continent of the fish industry since the war, only made possible since cold storage and canning processes have been evolved. The papers presented in this section last year were full of interest, pointing out how during the decade of 1900–1909 the fish-canning industry on this continent increased much less then any other canning industry. It has needed an actual dearth of meats through war to teach us the value of fish products and to develop the methods for their distribution. When we learn that frozen halibut from Alaska and British Columbia are reaching the markets of the East of England, and the troops in France, we can understand how the harvest of the seas is at our disposal, so soon as we avail ourselves of scientific means for its conservation. It seems no unlikely dream to expect, instead of ships going to the Arctic and Subarctic laden with food for exploration parties, that we may some day see the eggs of great flocks of sea-birds being collected, their contents concentrated and cargoes brought to the world's markets in cold storage, just as we have eggs from China sterilized and put on the markets.

But one more reference need be made and that is to the increasing use of the oldest conserving process, that of drying and smoking, which reaches back into the centuries and was utilized by savage tribes during uncounted ages. Seeing its value and early to take advantage of it for economic war purposes, Germany had in 1914 over 988 factories for drying potatoes. By these 30,000,000 tons of raw potatoes produced 12,000,000 tons of dried product containing about 17 per cent of moisture. Such is used not only in the usual way as food for men, but further is dried for flour, and is supplied as food for horses and cattle in cubes and flakes. Centrifugal machines are capable of drying from one to five tons per hour at a cost of from six to eight cents per one hundred pounds of dried product.

But enough has been indicated by your Committee to make it evident that the food problem is a most complex one, that in the past its solution has almost wholly depended upon accident due to ignorance, custom and defective means of transportation; that in modern times it has become the hand-maid of steamship and railway development by which the commerce of the seas has been increasingly associated with the railway extension, which again through its land grants

has determined the direction of immigration and with its increase the enormous expansion of the growth of wheat and of cattle on the wide prairies and pampas of America, the steppes of Siberia, and the plains of Australia.

British industry since Toussaint's first ship to LaPlata in 1880, fitted with refrigeration, has increasingly been fed with chilled beef and bacon from America and frozen mutton from Australia; while the home-fed beef from the pastures of the midlands, and highlands mutton from the Grampians, has become the choice food only of the well-to-do.

During the same period roller-process flour has been robbing even the cheap prairie wheat of its wholesome vitamines, thereby greatly affecting the growth of our children, while Minnesota millers have become multi-millionaires. Thus the wonderful progress of Science, whose victories have been seized by the captains of industry, has not been without its fly-in-the-ointment; but if the outcome of the demands and turmoil of war should lead to a better knowledge of the almost limitless bountifulness of Nature in her varieties and kinds of food, to a more intelligent use of those most essential to growth and development and to a more careful selection of those whose food values are most closely in keeping with their money value; and if above all the people everywhere will exercise the impelling will of a free democracy, through legislation, to promote the freest distribution of world products and the careful equalization of profits between the producer and consumer, then we may yet live to see the outcome of the war as not wholly evil, but even a blessing to those who come after us.

William A. Taylor, M. D.,
Prof. Curtis M. Hilliard,
Irvin S. Osborn,
Prof. Wilfrid Sadler,
Peter H. Bryce, M. D., *Chairman.*
Committee on Conservation and Development of Food Supplies.

DON'T DRINK SHIPS!

U. S. Food Administration.

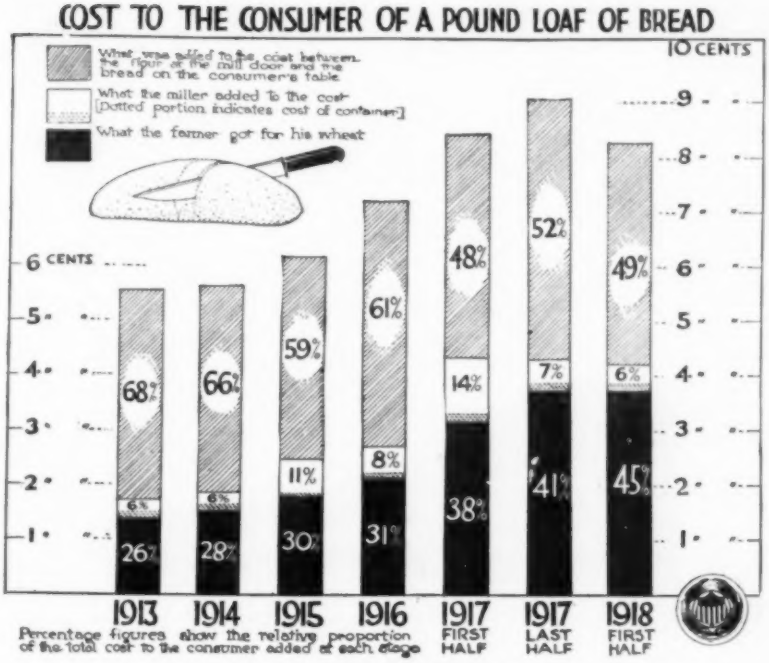
Are you shocked to see the lady drinking ships?

You drink ships every time you use sugar unnecessarily, in a beverage.

Seventy-five per cent. of the sugar used in this country has to be brought here in ships. Every possible ship is needed for the transportation of troops and supplies to the other side.

Eliminate sugar as a luxury, and you release many ships for war purposes.

Teach your appetite to remember this—
DON'T DRINK SHIPS.



U. S. FOOD ADMINISTRATION,
WASHINGTON, D. C.

Cost to the Consumer of a Pound Loaf of Bread

(EXPLANATION OF CHART)

Since 1913 farmers have been receiving for their wheat a gradually increasing proportion of the price paid by the consumer for bread. The amount received by the wheat grower for his contribution to the average pound has increased from less than 1½ cents per loaf in 1913 to more than 3½ cents early this year. The proportion to the whole price is shown by the relative length of the black columns of the chart.

The middle portion of each column shows what the miller received for his milling costs and profit. This has been a somewhat variable factor, but is now at the minimum (6 per cent). In this 6 per cent, however, is included the cost of the containers (bags, sacks, etc.) shown as dotted area which has increased very nearly in proportion to the price of bread itself. Bags now cost about 50 per cent more than in 1913 and 1914.

The shaded portion of the column represents the expense of distributing the flour, making it into bread and getting the loaf to the consumer.

The chart shows that the farmer is now receiving a much larger share of the final price for his product than in the past, and that a considerable amount of "spread" has been taken out of other expenses.

*

Control of Meningitis.—Simon Flexner emphasizes the importance of the carrier question in the fight against meningitis, especially in our new army. Two essential facts appear: first, that numbers of meningococci are thrown off with the naso-pharyngeal secretion, and second, that the bacteriologic type or variety of the organism plays a large part in determining the result. Thus the healthy carrier who harbors many meningococci is a much greater potential menace than one who harbors few. Bacteriologists are agreed that the meningococci are a complex group rather than any fixed type of microorganism. Recent studies also indicate that this group contains two immunologic varieties which are responsible for from 75 to 80 per cent of all cases of epidemic meningitis. The rest of the cases are caused by meningococci of less fixed qualities, and also less parasitic. The healthy carriers have been found to harbor rather the less pathogenic varieties, but once cases become frequent the number of healthy parasitic carriers increases. We now can tentatively view the meningococci as we do the pneumococci and assume that there are miscellaneous meningococci corresponding to the Type IV class of the pneumococcus which is still regarded as saprophytic, and practically always present in the mouths of a large proportion of healthy persons. If we continue in this line of comparison we should regard as menacing only the carriers of the parasitic varieties.—Flexner, S., *Journal A. M. A.*, Aug. 24, 1918, p. 638. (*D. G.*)

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THE ANNUAL MEETING POSTPONED.

The postponement of the annual meeting from October 14–17 to December 9–12 came to many of our members as a keen disappointment.

When it became apparent that influenza threatened to interfere with the meeting, the secretary communicated with the members of the Executive Committee and a meeting was held in New York City, October 5.

The proper course of action was not clearly indicated. The Central States, from which about three-fourths of the total attendance was expected, strongly favored the holding of the meeting; the local committees at Chicago had been busy with preparations for months; about a half-dozen other societies had coördinated themselves with the meeting of the American Public Health Association; advance notices had been sent to all parts of the country over the wires of the press bureaus; many scientific and commercial organizations had made arrangements to send exhibits; the state health officers of the upper Mississippi Valley had sent several thousand letters to local health officials advertising the date of the meeting and urging attendance.

Postponement of the meeting meant the undoing of all of these activities.

Again, the health officials of the Central States, where influenza had not yet become seriously epidemic, were eager for a discussion of the subject. They wanted to know what success the East was having with vaccines; what were their views on the subject of nose and throat sprays; what lessons was the epidemic teaching with regard to mode of treatment, the marshaling of nurses, doctors, and other forces for combating the disease.

On the other hand, as time went on it became increasingly clear that not only would the attendance from the East and South have been almost nil, but that at least a third —possibly half—of the speakers and section officers would have been absent. Boston, New York City, and Washington, D. C., whence came the great majority of the speakers, were prostrated by the epidemic.

It was after a conference with the Surgeon-General of the United States Public Health Service, who strongly urged against the meeting, that President Hastings again telegraphed the members of the Executive Committee, as a result of which action, the vote for postponement was taken.

Owing to the crippled condition of the telegraph service, the result of the vote did

not reach the secretary's office until Wednesday morning, October 9. However, two thousand letters and many telegrams were rushed out to members, speakers, and others before the office force left that night. A notice concerning the cancellation was sent out over the wires of the Associated Press and the United Press from Chicago and Boston. In short, the president at Toronto, the chairman of the Central Committee at Chicago, and the secretary at Boston, did all in their power to spread news of the postponement of the meeting as widely and rapidly as possible; and it is hoped that all delegates were reached in one way or another.

The postponed meeting will be held December 9–12. Headquarters will be at Hotel Morrison, Chicago, as previously announced. In general, the arrangement of the section meetings will be relatively the same as in the original program which was published in the September issue. The more important changes will be published in the JOURNAL for November, which will appear about November 25.

Speakers are being requested to send their manuscripts to the office of the JOURNAL for possible publication where advisable, in advance of the annual meeting. Unless already forwarded, two hundred word press abstracts are also desired.

The postponement has worked a real hardship upon the section officers and the committee members at Chicago, who gave generously of their time and energy in order that the October meeting might be successful. In some instances this work will have to be repeated, especially in the case of the Chicago committees. The latter, however, have with boundless goodwill, again set themselves to their tasks; and for this, the Association owes them a great debt of gratitude.

While in one sense the postponement was a disappointment, it is believed that the December meeting will be more successful than that of October could have been, and we shall have the additional satisfaction of knowing that the best interests of the Association, of the profession, and of the Nation, will have been served by the postponement.

Decide now to come in December. In the meantime tell of the Association and the annual meeting to your public health acquaintances, plan to enrol them as members, and bring them to the meeting.

WEAPONS AGAINST INFLUENZA.

Early in October a representative of a midwestern health department went East in order to secure information as to the best-known methods of combating influenza. A number of prominent sanitarians began with this advice: "When you get back home, hunt up your wood-workers and cabinet-makers and set them to making coffins. Then take your street laborers and set them to digging graves. If you do this you will not have your dead accumulating faster than you can dispose of them." They then went on to discuss the measures which had been tried with varying success for fighting the disease itself.

The object of the foregoing suggestion was not to appear sensational or to cause undue alarm; it was a sincere effort to point out a practical condition which would probably have to be met. Very few health officers, and no communities, appreciate the terrific devastation of the epidemic until it strikes them. It has been utterly unlike any plague which has yet visited this country.

Exact statistics concerning the prevalence of influenza among the general population are not available. It seems, however, that no less than 25 per cent of the population are taken ill in communities where the disease strikes. Very roughly, the fatality seems to range within 3 and 5 per cent of the cases.

Boston, with a total population of less than 800,000, has had about 4,000 deaths from the beginning of the disease early in September to October 19. In other words, .5 of 1 per cent of the population has succumbed. If the rest of the country is afflicted in the same proportion, it is not unlikely that there will be a half-million deaths from the disease; that is, about half as many as died from all causes last year; or far more than fifty times as many as have been killed in the American army in the present war.

Among the prophylactic measures have been employed in the East: the conventional precautions against contact infection, the face mask, and anti-influenza vaccine.

Among the curative measures have been advocated: the open-air treatment, the use of serum from convalescent patients, and again, anti-influenza vaccine.

In the reduction of contact infection, the face mask, the stagger-hour system of transportation, the education of the public in personal hygiene, and the closing of schools, assemblies, etc., have probably helped somewhat. There seems to be little hope for controlling the epidemic along these lines, however, for the scourge is more communicable than measles.

As for the vaccine, the Massachusetts scientific and statistical commissions have concluded that it has no therapeutic effect,* that the prophylactic effect merits further investigation, and that no ill effects follow the use of the vaccine. The South Department of the Boston City Hospital reports 46 vaccinations, none of which were followed by influenza; on the other hand, of the remaining 88 attendants and patients, 28 contracted the disease—about a third.

Another analysis from the same figures shows that of 32 vaccinated nurses none contracted influenza; 8, who had been incompletely vaccinated, contracted mild cases. The remaining 4 nurses refused to be vaccinated: of these, two developed influenza and died.

At Wrentham (Mass.) State School, 66 vaccinations are said to have been followed by 6 mild cases, and no fatal cases. One incompletely vaccinated individual developed a fatal case. Of the remaining 58, who were not vaccinated, 33 sickened, and one died.

The results which are available are interesting and suggestive, but not conclusive; for they all have the weakness that vaccination was not begun until influenza had developed in the institution, and had taken down a number, possibly the most susceptible, who might have taken the disease even if vaccinated. But while we wait for more conclusive statistics, the epidemic rages; any community is, therefore, justified in employing the vaccine, for it is safer to gamble with the cost of preparing and administering the vaccine than with the lives endangered. It will be well to emphasize to the public that the vaccination is experimental, and is not compulsory; otherwise, in the event of its ultimate failure, the whole system of vaccination may be discredited by the public, including that against smallpox, typhoid, etc.

Turning to therapeutic efforts, the serum described in this issue by McGuire and Redden seems promising and should by all means be tried. As with vaccine, however, it is too early to make definite statements.

The open-air treatment of Brooks was found by the Massachusetts State Health Department to be the most valuable factor in reducing mortality. Apparently the fatality of hospital cases was reduced from 40 per cent to about 13 per cent by the treatment. An invaluable incident to this treatment is the fact that in the open air, the immunity of the nurses and physicians is enormously increased, leaving them to carry out the great amount of work confronting them.

What should health officers do in those communities where the disease has not yet struck? Shall they build fences to try to keep people from falling off the cliff or shall they invest in ambulances to take care of those who will have fallen?

It must be confessed that to date the preventive measures have not averted the epidemic. It would seem advisable for the health officer first to organise his open-air hospitals and relief agencies as far in advance as possible; let him organize for efficiency the doctors, nurses, social workers, teachers, and volunteers. Money and assistance will be easy to get, for the public has been aroused. With one in two hundred persons of the stricken populations dying, no community will criticise the health officer who may have prepared too thoroughly.

The health officer should also put into effect with great vigor all of the preventive measures at his disposal. Let him not neglect, however, to plan for those who are sure to become sick—and as pointed out to the investigator in the first paragraph—for those who will die.

Regrettable and discouraging as it is, we must nevertheless admit that in this specific catastrophe, the ambulance possibly will help more than the fence.

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*See the notes section of this issue, p. 832.

THE INFLUENZA PAPERS IN THIS ISSUE

Under ordinary circumstances an investigator is expected to give his discoveries most careful and deliberate scrutiny before presenting them to the scientific world. There is a great aversion, and properly so, to the hasty publication of theories.

At the present time, however, we are facing an unusual condition under which rules must give way. If we allow time for careful investigation and statistical analysis of the various means for combating the influenza epidemic, the disease will have left us before conclusions are reached. In average-size cities, the epidemic begins, reaches its crisis, and subsides to relatively small proportions in a community in scarcely more than forty-five days. In view of these facts it becomes a positive duty to immediately make known any methods of fighting the disease that seem at all helpful.

The writers of the papers in this issue of the JOURNAL have hastened to give what information they could in order to help subdue the epidemic. Their recommendations are provisional and preliminary, not final, and should be accepted as such. If some of their proposals shall not have been justified they will still be entitled to great credit for their efforts and certainly not to any blame for hasty expression.

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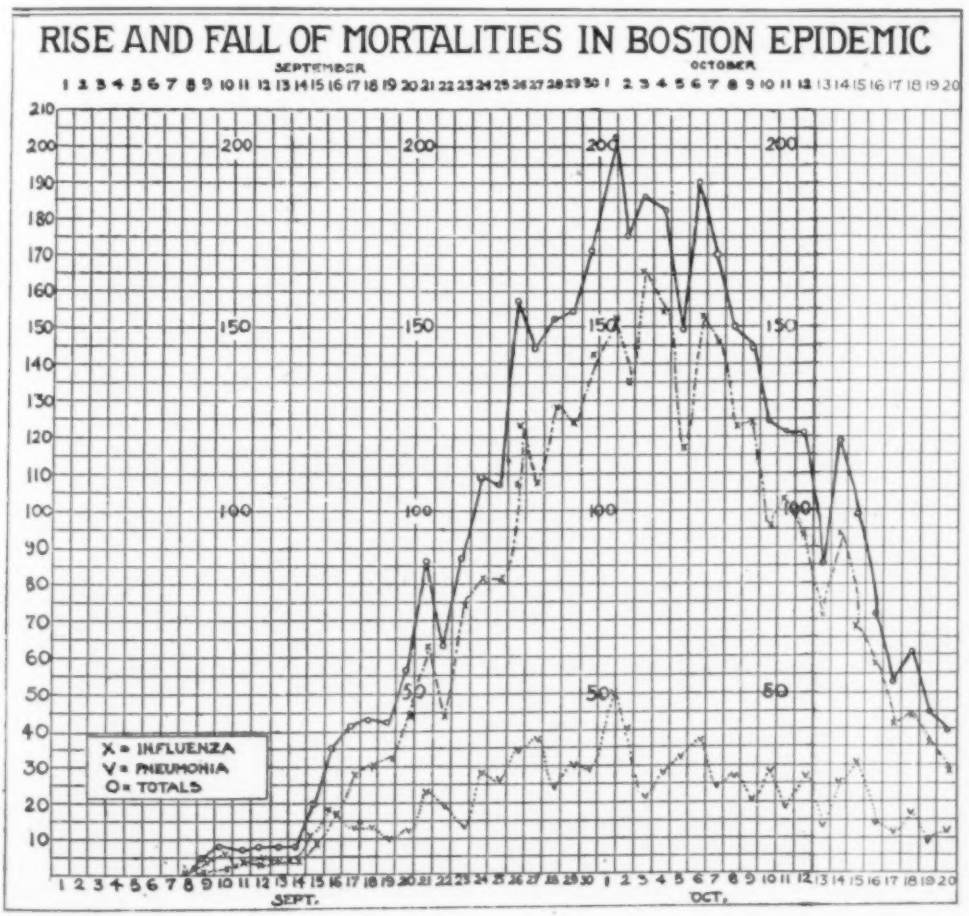

ASSOCIATION NEWS

By the Secretary, A. W. Hedrich.

A Food Journal for the Association.—The Council of the Food and Drugs Section of the Association has recently had under consideration the advisability of publishing a journal of this type. The question arose as a result of the offer for sale to the Association of a publication which has for some years been in this field. The price set was $10,000.

Great interest was manifested in the project, and it was the opinion of the Council that a journal covering the various aspects of the food supply—regulative, nutritional, and economic—could be profitably published by the Association, and would be very beneficial to the profession. It was the recommendation of the Council, however, that the food journal in question be not taken over at this time, for various reasons; but that a committee be appointed to give the question serious consideration, with a view to taking action at a later time, possibly at the end of the War.

Health Employment Bureau.—The demand for sanitarians continues to outstrip the supply. The Health Employment Bureau receives frequent calls for applicants which it is unable to fill. Owing to the changes incident to the War, a revision of the files of applicants is about to be undertaken. Registration in the Bureau is free to members. Application cards may be obtained by writing to the office of the Association at 126 Massachusetts Ave., Boston, Mass.

Applicants are earnestly requested to answer all inquiries from prospective employers and to notify the Bureau immediately in the event that they have accepted a new position.

HELP WANTED.

In order to help relieve the shortage of sanitarians due to the war, free help-wanted announcements will be carried in this column until further notice. Copy goes to the printer on the first of each month. In answering keyed advertisements, please mail replies separately.

The Health Employment Bureau also sends lists of applicants to prospective employers without charge.

Chemist in Hygienic Laboratory, West Virginia, preferably a lady. Address No. 165, J. L. S., care of this Journal.

Director of State Health Laboratory and Professor of Bacteriology and Pathology in University in Middle West. Salary, $4,000. Address No. 166, L. O. C., care of this Journal.

Laboratory worker, man or woman, to do work of city laboratory, including bacteriology, food, milk, and water analysis, with ability to control filtration plant. Salary, $1,800 with prospect of prompt increase if satisfactory. Address No. 167, L. E. C., care of this Journal.

Instructor in Military Hygiene and Sanitation in University in Iowa. Fundamental training in hygiene and sanitation essential. Experience in military hygiene and sanitation desirable but unnecessary. Appointment for one year. Salary between $2,000 and $2,500. Address No. 168, H. H. J., care of this Journal.

Physician for assistant health officer and city and county physician in the South. Salary, beginning at $1,800 with prospects of early increase. Address No. 170, L. E. C., care of this Journal.

Physician for field director, desiring to devote entire time to preventive medicine, between the ages of twenty and forty, with a pleasing personality and prepossessing appearance, good habits, energetic, reliable, and having a thorough preliminary and medical education. Salary, $2,100 a year and expenses when traveling in the interest of work. Address No. 171, C. W. P., care of this Journal.

Epidemiologist in a State Health Department in the East. Address No. 172, B. T. J., care of this Journal.

Health officer for Delaware city. Salary, $4,000 to $4,500. Address No. 173, C. H., care of this Journal.

A trained statistician with a broad vision. Salary, between $2,400 and $3,000. Write the National Social Unit Organization, 1820 Freeman Avenue, Cincinnati, Ohio.

A Government Bureau is in need of expert sanitarians along the following lines:

Sanitarians who have had training or experience in industrial hygiene;

Physicians who have had experience in industrial diseases and accidents;

Mechanical engineers with experience in safety engineering;

Ventilating engineers acquainted with the problems involved in the elimination of fumes and gases and the removal of trade dusts.

Those who are interested should write at once, giving their qualifications, past experience, special education, age, present salary, etc. Address No. 174, N. J. B., care of this Journal.

The following were elected to membership October 9:

Marshall C. Balfour, Marlboro, Mass., Student Biology and Public Health.

E. Stewart Murphail, Ottawa, Ont., Superintendent of Compilation of Census and Vital Statistics.

Rhea R. Fuller, Cambridge, Mass., Student Massachusetts Institute of Technology.

Marion E. Anthony, Barrington, R. I.

F. M. Veatch, B. S., Lawrence, Kans., Engineer in Charge, State Board of Health.

Alvin H. Rockwell, M. D., Kalamazoo, Mich., Health Officer.

Dwight E. Breed, Austin, Tex., Executive Secretary, Texas Public Health Ass'n.

C. E. Bevan, M. D., West Haven, Conn., Physician.

Henry F. Moody, Westfield, Mass., Agent, Board of Health.

Bradford H. Peirce, M. D., Cambridge, Mass., Medical Inspector, Board of Health.

William F. Butler, M. D., New Port, Ind., Physician.

Frank M. McGauley, M. D., Fond du Lac, Wis., Physician.

J. E. Meany, M. D., Manitowoc, Wis., Physician.

Lucius H. Zeuch, M. D., Chicago, Ill., Physician and Surgeon.

Reuben L. Kahn, B. S., M. S., D. Sc., Atlanta, Ga., 1st Lieutenant, Sanitary Corps.

Gustave Windesheim, M. D., Kenosha, Wis., Health Commissioner.

Department of Health, Orange, N. J., John O'Brien, S. E., Orange, N. J.

John P. Sprague, M. D., Philadelphia, Pa., Medical Officer, U. S. Shipping Board, Emergency Fleet Corp.

Charles G. Forrest, M. D., Clearbrook, Minn., Physician.

John H. Hamilton, M. D., Iowa City, Ia., Instructor, University of Iowa.

Charles E. Riggs, Washington, D. C., Naval Officer, Medical Director.

James J. Biggerstaff, M. D., Wabash, Ind., Physician and Surgeon.

Eric A. Crull, M. D., Fort Wayne, Ind., Physician.

Virgil D. Selleck, M. D., Glen Falls, N. Y., Health Officer.

Florentino Ampil, M. D., Butun, P. I., District Health Officer, Providence of Agutun.

George H. Jones, Jefferson City, Mo., Secretary, State Health Board.

F. M. McGanley, M. D., Fond du Lac, Wis., Health Officer.

John P. Koehler, A. M., M. D., Milwaukee, Wis., Deputy Commissioner of Health.

Carroll D. Partridge, B. S., M. D., Milwaukee, Wis., City Bacteriologist.

William Frank Adams, A. B., Wilmington, N. C., Director of Public Health Laboratory.

National Life Insurance Company, Montpelier, Vt., corporate.

S. R. Klein, M. D., Ph. D., New York City.

Chalmer J. Longstreet, M. D., Binghamton, N. Y., Health Officer.

W. I. Fugate, M. D., New Castle, Ind., Physician.

Robert Hessler, M. D., Logansport, Ind., Physician.

Irwin D. Groak, Chicago, Ill., Mechanical and Consulting Engineer.

J. H. Ravenscraft, M. D., Albion, Ind., County Health Commissioner.

George O. Pobe, M. D., Port Jervis, N. Y., Physician.

Thomas P. C. Barnard, M. D., North Tonawanda, N. Y., Health Officer.

Arthur LeRoy Wheeler, M. D., Mason City, Ia., Superintendent, Department of Health.

Henry C. Schoeffle, M. D., Sandusky, Ohio.

Henry F. Miller, B. S., Kenosha, Wis., Chemist and Bacteriologist.

J. W. Fehnel, B. S., Bethlehem, Pa., Chemist and Bacteriologist.

Harry A. Neumann, M. D., Bridgeport, Conn., Industrial Physician.

James W. Armstrong, M. D., Centralia, Ill., Physician.

Reuben F. Frost, M. D., Huntington, Ind., Physician.

J. C. Quick, M. D., Muncie, Ind.

Oran A. Province, M. D., Franklin, Ind., Physician and Surgeon.

John S. Sidley, M. D., Racine, Wis.

Charles R. Cox, Hagerstown, Md., Sanitary Engineer.

Mrs. Julia Kurtz, Martha Washington Home, Wauwatosa, Wis., Manager and General Superintendent.

Otto E. Eckert, Lansing, Mich., Civil Engineer.

STORIES FROM THE DAY'S WORK

Contributions to this section are invited.—*Editor.*

AN EXPOSURE OF TWO CANCER CURE FAKERS.

How ungrounded reports of an alleged cure for cancer brought about misery and suffering came under my own observation. In a small town of some 10,000 inhabitants two gardeners, with little education and no medical knowledge, by some freak or accident were started on a cancer curing career by reason of having supposed to have relieved or cured a young man suffering from "sarcoma" of the knee joint. The veracity or reliability of this "cure" could never be determined, but such was the publicity given to the case that it was sufficient to launch a boom that nearly swamped the small town in question.

When I arrived in the locality as deputy for the local health officer, I found the town overrun with persons suffering from cancer in every variety and stage of development. Lodgings and hotel accommodations were at a premium and many of the townspeople had in pity taken the sufferers in to board.

There were at this time a number of complaints that the cancer curers had been so overwhelmed with business that they could not treat their patients in their own homes and their treatment had been carried on in backyards and in public parks and in roads. This brought about nuisances arising from soiled dressings which were thrown about vacant lots.

An investigation of the curers and the alleged cure showed that the two gardeners didn't profess to practice medicine and charged no fee for attendance or drugs provided but were willing to receive voluntary gifts for attendance upon suitable cases selected by themselves. The drugs used as the "cure" were an herbal solution for internal use and a caustic ointment made from chloride of zinc.

It was claimed by the curers that their drugs ate out the cancer which surely was true as many of the cases testified by the huge excavations and eroded surfaces seen in some of the unfortunates after treatment.

After the application of the ointment much virtue was attached to the use of a dressing made of cabbage leaves.

As more and more patients flocked to this town many complaints reached the Health Department of odors and unsanitary conditions produced by cast off dressings and cabbage leaves.

House to house investigation of the homes of the cases showed that many were without funds having spent their only available cash in railway fares to reach the town.

In response to the demand of public opinion in the town and as the falsity of the cure was already becoming known, efforts were successful to have the hopeless cases returned to their home towns by public subscription and private funds.

A publicity campaign was finally started in the district whereby the curers were discredited and the two gardeners returned to their gardening.

This little incident records the cruelty and inhumanity of widely advertised cures without the basis of truth or reason and calls again for the dissemination of knowledge of the true facts of the case for hope in the cure of malignant diseases.

C. V. Craster,
Health Officer,
Newark, N. J.

A DIPHTHERIA SAFEGUARD.

Since 1915, the Cumberland Department of Health has required that a negative culture from the nose and throat be submitted by the attending physician, before diphtheria quarantine was raised. Though this measure resulted in some good, there was clearly too much spreading of diphtheria still. Consequently in June, 1917, physicians were advised that two negative cultures would be required from the patient before releasing, one to be taken by the physician and the second by a representative of the Health Department. When collecting a second specimen from the patient the Health Department also secures specimens from the nose and throat of each member of the family, whether sick or not.

The results secured by virtue of this order have been astonishing. It has shown us that in many cases specimens collected by physicians were either carelessly taken or else intentionally failed to even touch the area usually swabbed for diphtheria. In many cases a release culture would be submitted by a physician and upon examination found negative. The second specimen collected by the Health Department would be found positive. The physician's attention would be called to this fact and after a lapse of several days, during which time a gargle would be used, another specimen submitted by him would be negative, while a fourth specimen taken

by the Health Department would be positive again. In several cases this negative and positive rotation lasted for six or eight weeks.

Collecting specimens from all members of the family has resulted in picking up a few carriers, who otherwise would have gone undetected, and perhaps caused other cases of diphtheria. The number of cases reported show that this procedure has been more than worth the trouble. When we have found carriers we have assumed that they were dangerous to be at large.

The dangers encountered by releasing diphtheria cases without securing negative specimens from the patient and his family may be well illustrated by a recent case. Six days after a three-year-old boy from Davis, W. Va., came to Cumberland to visit his relatives, a cousin, five years old, became ill with diphtheria and died. After investigating the case and collecting specimens from every member of the family and the visitors, it was found that the West Virginia boy harbored diphtheria organisms in the nose and throat. Questioning the child's mother it was learned that the boy had had diphtheria about a year ago. He had been released when the attending physician said it was proper to do so.

This case brought the matter home very forcibly, and we are now more careful than ever in releasing diphtheria cases.

MAX J. COLTON,
Health Officer, Cumberland, Md.

LETTER AND REPLY.

VALPARAISO, IND., Sept. 10, 1918.

DR. O. B. NESBIT,
Gary, Ind.

Dear Sir:

This is, you probably will think, a queer message, but my conscience has bothered me until I am constrained to write concerning it.

I rather think, although I am not certain, that you were the health officer in March and April when I had the scarlet fever. Around the end of six weeks, Papa was asked if I were through pealing and he said that I was. I don't believe I was as my heal did not exactly seem finished. However, a man, Mr. Malone, I think, was sent up and he fumigated the house and we were let out without any examination. I know, too, or was told, of another case of people getting out without being through pealing or scaling. I wonder about others being exposed by that method.

If there is a fine, let me know, just me, please, and no one else.

Yours respectfully,

———— ————.

THE REPLY.

GARY, IND., Sept. 10, 1918.

Dear Miss:

I was not the health officer at the time you refer to. If I had been you would not have been released without an examination by a physician.

I do not think the scales from your heal at all dangerous. If you had no discharge from your nose, your throat was entirely well, there was no running ear or suppurating glands, and no cavities in your teeth, you probably did not spread the disease to any one. If any of your associates developed the disease after you were released you may have been responsible.

Sincerely yours,
O. B. NESBIT,
Director of Medical Inspection, Gary Public Schools.

A BOLD "DOPE" SELLER.

Strange things happen to the health officer, but the strangest in my experience happened when a "hop-head" tried to make the Chief of Police and myself accessories in the sale of morphine to "fiends."

One afternoon a well-dressed man entered the Palo Alto Health Department, and asked for the health officer. He introduced himself as an operative of the United States Secret Service, and asked if I could determine the presence of morphine in some tablets he had, which he stated he had taken from a "dope fiend" in a neighboring town. I made a series of presumptive tests, and at his request made out a written statement to the effect that the tablets were 1 grain morphine tablets. He asked me a number of questions in regard to morphine users in the city, and then went to the Chief of Police, and tried to get from him a list of suspected "hop-heads," for the purpose, he stated, of apprehending them.

The next day the Chief and I discussed the matter, and our suspicions were aroused. We immediately telephoned to the Secret Service office in San Francisco, and tried to apprehend the man at the same time. The Secret Service advised us that there was no operative of that name or description, and immediately put a special operative on the case. In the meantime, the bogus operative got suspicious in some way, and we barely missed him as he got out of town. He was later apprehended in another city, being traced from the clues we supplied, and proved to be a distributor of "dope."

His game was, by this pretense, to get a list of users to whom he could sell the morphine.

HAROLD GRAY,
District Health Officer,
Sacramento, Cal.

BOOKS AND REPORTS REVIEWED

Syphilis and Public Health. *Edward B. Vedder, A. M., M. D., Lieutenant-Colonel, Medical Corps, U. S. Army. Published by Permission of the Surgeon-General, U. S. Army. Philadelphia: Lea and Febiger,* 1918. *Cloth, p.* 315. *Price,* $2.25.

No problem of preventive medicine compares in interest and importance with the prevention of venereal diseases. This is especially true at this time when the war experience of the Allied Nations has shown the menace of these diseases to military efficiency, and reëmphasized their constant threat to the human race. Colonel Vedder's experience as an army surgeon has given him practical knowledge of army methods of control, whereby venereal disease in army life has been reduced to a minimum. His book is therefore addressed to the medical profession and to health authorities and is a plea for the application to civil life of the measures proven so successful in army life.

For the person interested in statistics, the author has compiled in brief and readable form all the statistical data available on venereal diseases; for the busy physician he has made clear the path of duty to venereal patient and society; for the health officer he has outlined plainly the only plan of preventive attack thus far that has tangible results to its credit.

The book is easily the best among the many recently published upon this subject. It is well written and timely and deserves the consideration of any one interested in the prevention of venereal diseases.

In an appendix the author describes the technic of the Wasserman reaction and includes the full text of the Australian law for venereal disease control, which is the model for most of the laws and regulations now being adopted throughout the United States. *W. F. King, M. D.*

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Farmers' Clean Milk Book. *Charles Edward North, M. D. John Wiley & Sons, Inc.,* 1918. *Pp.* 132. *Price,* $1.00.

"This book shows why some milk contains millions of bacteria and how they get into it and how easy it is to keep them out." This substantially is the text taken by the author in presenting his viewpoint of the essential subject of clean milk production. The style is lucid, simple and attractive. The farmer is shown in a practical manner the difference between successful and money-losing dairying, and the lesson is taught that cleanliness, care and oversight, as applied to milk production, have a commercial value, an argument which appeals when others might fail.

The importance of bacteria to milk is presented in such a manner as to create both interest and endeavor for increased safeguards. The human element and methods, and not elaborate and expensive equipment, are shown to be the prime factors for good milk production. The farmer is also made to realize the value of ice, cold water, steam and hot water to his industry.

The path of the dairy inspector in his dealings with the farmer might have been made smoother had the author pointed to the fact that the endeavor of these officials has been one of coöperation for better things in the production of milk. Had it not been for these efforts, doubtless this commendable and progressive work would not have been written. Dr. North's condemnation of the score card will meet the approval of many officials and farmers, even though the comparison of the score card and strainer cloth as "dangerous instruments in the dairy business" may not be fully sanctioned as to the latter by the farmer. Possibly the final chapter would carry a greater appeal if the word "good" were substituted for "Grade A," in the title, "Essentials for Grade A Milk Production."

Dr. North's work is elementary, but concise and complete, and many milk producers would benefit financially by following its teachings. It will have an important bearing in improving dairy methods, and is entitled to wide circulation.

James O. Jordan.

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The Hospital as a Social Agent in the Community *Lucy C. Catlin, R. N., Director of Social Service Work and Executive Director of the Out-Patient Department of Youngstown Hospital, Ohio.* 113 *pages, illustrated. Philadelphia and London: W. B. Saunders Company,* 1918. Cloth $1.25, *net.*

Miss Catlin's book is an indication of the rapidity with which a sense of community needs has penetrated into the medical work of hospitals. It is only twelve years ago since the first social service Department in the United States was founded at the Massachusetts General Hospital, by Dr. Richard C. Cabot. Now, about 300 of the leading hos-

pitals and dispensaries of the country have such departments, and the number is increasing yearly. The hospital, highly specialized as it is, tends too often to look upon the patient as bringing with him simply a disease. From this old-time institutional standpoint, a patient may almost be said to be merely a disease, or a bundle of diseases. But to the social service department he is a human being. The social service department, says Miss Catlin, has two functions: (1) of completing service to the patient, by supplementing the strictly medical care with the help which will enable the patient to regain his place and take up his work, or his family life, in the community; (2) The very practical help which such a department gives to making the work of the physicians and surgeons more efficient in both diagnosis and treatment is also indicated.

Miss Catlin's book is full of stories of cases, based on her experience in Youngstown, showing many of the human problems which are met in connection with the medical work in a dispensary or hospital, and the manner in which social service assists in dealing with these problems. In comparison with the authoritative work of Miss Ida M. Cannon on "Social Service in Hospitals," Miss Catlin's book will be found to be more descriptive and less of a practical handbook of the important substance with which a Social Service department deals. Little appears in Miss Catlin's work which will help in the training of the medical social worker. There is, however, much of a descriptive nature, which will be stimulating to those who have a general interest in the subject and who are approaching it for the first time. As an introductory book for reading by nurses, teachers, doctors, and the general public, the book is one of many which are needed today. Illustrations and forms add to its interest and practical utility.

Michael M. Davis, Jr.

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A Sanitary Survey of Charleston, West Virginia *Mayo Tolman,* 1918.

It is becoming more and more evident to sanitarians that the public is showing an awakening interest in public health matters. Such interest can greatly be stimulated by an exposition of the conditions and needs of a community. It is this message which is most admirably conveyed to the citizens of Charleston by the author in this survey. The report is so comprehensive that hardly more than mention of some of the topics treated can be made. The modes of transmission of the communicable diseases is clearly and interestingly narrated. Charleston's experiences with epidemics are selected for illustrations. Conditions existing in other cities are contrasted with those in Charleston and the lesson is strikingly pointed out. The question of clean milk is ably treated. A most exhaustive study of the cost of production and distribution of milk was made as part of the survey. The engineering phase of public health is most admirably treated in the sections on the water supply and the sewerage system of the city. The author wisely points out that in the solution of the housing problem "all too frequently it has been the custom to base reform in this direction on aesthetic principles and to lose sight of the fact that in the last analysis, housing must have its solution in its economic aspects." The report is written in a most readable style and is a model in the presentation of the health needs of Charleston.

D. Greenberg.

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A Practical Text-Book of Infection, Immunity and Specific Therapy. *John A. Kolmer. 2nd Edition. Philadelphia, W. B. Saunders Co.,* 1917. *Pp.* 13+978. *Price,* $7.50.

The second edition of this well known treatise will be welcomed by all laboratory workers. Among the important additions and alterations may be noted the discussion of the Schick test and the immunization with diphtheria toxin—antitoxin mixtures, the well considered expansion of the chapter on chemotherapy and the excellent sections on anaphylaxis and serum diseases. The practical experience of the author is everywhere in evidence and lends authority to the theoretical discussions. These latter, it might be added, as in the chapter on agglutinins, are sometimes not as full as some students might desire, but the need for keeping the size of the book to reasonable limits is doubtless the explanation.

The reviewer has noted but few details worthy of emendatory suggestion. On page 86 it would perhaps express more precisely the author's meaning to speak of contact with specifically contaminated objects rather than unclean objects. On page 117 it is not quite in accord with our present knowledge to call botulism "a type of meat and sausage poisoning"; by far the majority of the outbreaks of botulism poisoning reported in this country have been due to canned vegetables and fruits. The statement (page 168) regarding the infection of mosquitoes with the malarial parasites could be made more illustrative, and also more exact, if changed so as to indicate that Anopheles quadrimaculatus may serve as a host for all three parasites while A. punctipennis and A. crucians are susceptible to infection with Plasmodium vivax and Plasmodium falciparum. On page 291 B. paratyphosus B is said to be more closely related in its agglutinable properties to

the typhoid bacillus than is B. paratyphosus AB. In point of fact these organisms do not show any very great differences in their agglutinative affinity towards B. typhosus; B. enteritidis is much nearer than either. A typographical omission occurs in the sentence: "In this country Bacillus paratyphosus [B?] is usually held responsible for paratyphoid fever." The statements in the same paragraph about differential serum diagnosis are partly corrected on pages 396 to 967 and 309 to 310 and might perhaps be modified so as to emphasize the great diagnostic superiority of bacterial isolation as compared with serum reactions. The parasite of syphilis is referred to as Treponema on pages 99, 292, 428 to 430, 448, and as Spirochæta on pages 416, 491, the latter name not appearing in the index. The important work of Kraus on the treatment of human anthrax with normal bovine serum will doubtless receive mention in the next edition.

Mechanically the book is excellent. There is a great wealth of illustration, including many colored plates, which will assuredly further the acquisition of exact technique. Relatively few typographical errors occur, although a letter is sometimes dropped or interpolated in certain proper names (*e. g.*, pages 262, 311, 583, 624, 650, 722, 796). The misprint Bacillis appears five times on page 693 and the common mistake of *virus fixé* is made in the section on rabies (page 685).

The book closes with an admirable series of practical exercises for the laboratory. It is not too much to say that Dr. Kolmer's work is indispensable for the practical worker in the field of infection and immunity. *Edwin O. Jordan.*

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The Principles and Practice of Infant Feeding. *Julius F. Hess, M. D. Published by F. A. Davis Co., Philadelphia,* 1918. *Price,* $2.00 *net.*

The object of this book is to present in a concise form the teachings which the author used in preparation for clinical conferences for his students. The first three chapters give a very good skeleton of what is known of the metabolism of infancy. It would have been of value, however, to have the references to look up the authority of some of the statements.

The chapters on intestinal bacteriology are especially to be commended. Practical advice in maternal nursing and wet-nursing is presented concisely and well.

The second half of the book is devoted to artificial feeding. It presents the opinions of the German School, even using the German nomenclature. It is presented in a concise and clear form.

The appendix has a valuable description of proprietary foods, and directions for the preparation of infants' foods. *Fritz B. Talbot, M. D.*

✱

The Wassermann Test. *Charles F. Craig, A. M. (Hon.), M. D. (Yale), Lieut.-Col., Medical Corps, U. S. A. The C. V. Mosby Company, St. Louis. Pp.* 239. *Price,* $3.00.

The medical profession will avail itself with pleasure of this publication which embodies the rich experience of the author with the Wassermann test. Part of the book is devoted to a description of the modification in use in the army. The modification was devised by the author and Dr. H. J. Nichols of the U. S. Medical Corps. It has been adopted as the standard by nearly all of the large army laboratories since 1913. It follows Wassermann in using an extract of foetal syphilitic liver as antigen and in inactivating the patient's blood serum. Like Noguchi the method employs a human hemolytic system instead of the sheep system. The authors believe that the method is well adapted to civilian laboratories. There is no doubt that this modification will be more extensively used in civilian practice upon the return of the many workers now employed in the military camps and hospitals to private life. A standardization of the Wassermann test has long been a crying need of the medical profession. Dr. Craig also discusses the original Wassermann, Noguchi, Gradwohl, Hecht-Weinberg and Kolmer technic. Considerable space is devoted to the interpretation of results and to the various factors influencing the test from the standpoint of the clinician and technician. One chapter deals with the colloidal gold test, the cell-count of cerebro-spinal fluid and with the globulin tests. The text is accompanied by numerous illustrations and well reproduced colored plates. The book should find an important place in the libraries of public health laboratories. *Arthur Lederer, M. D.*

PUBLIC HEALTH NOTES

Abstracted by DAVID GREENBERG and M. P. HOROWITZ.

Relative Values in Anti-Tuberculosis Work.—Attempts have been made to assign relative values to general health work. Now comes an effort to analyze the activities in anti-tubercu- losis work, and to assign definite values to the various factors involved. The article, appears in the *Boston Medical and Surgical Journal* for June 20, 1918, and is written by Professor C. M. Hilliard. The various items enumerated below are thoroughly discussed:

Avoidance of infection	20
Unlimited protection up to 4 years	10
Hospitalization of open cases	4
Promiscuous spread of infection	3
Anti-spitting	0.5
Anti-sputum (education)	2.5
Bovine tuberculosis	3
Meat inspection	0.1
Healthy cattle and clean milk	0.1
Pasteurization	2.8
Detection and cure of tuberculosis	16
Early detection	7
Prompt reporting	3
To authorities	1.5
To patient and family	1.5
Modern treatment (home or sanatorium)	4
Open air schools	1.9
Tuberculin	0.1
Elimination of predisposing causes	39
Avoidance of fatigue	10
Adequate nutrition	10
Alcoholism	0.5
Occupation	5
Dusty	3
Other atmospheric conditions	1
Posture	1
Preventing other diseases	5
Good housing conditions	1
Ameliorating poverty	7
Inheritance	0.5
Public Health Nursing	25
Educational work	15
Assistance in detecting and reporting cases	3
As a social agent	2
Infant welfare	2
School nursing	2
Industrial nursing	1

(*M. P. H.*)

Visiting Nursing and Life Insurance.—The results of eight years of public health nursing for policyholders of the Metropolitan Life Insurance Company are summarized in an article by Frankel and Dublin in the Quarterly Publication of the American Statistical Association (June, 1918). The nursing as reflected in the condition of patients on discharge shows that in 1916 about 74 per cent were discharged as either recovered or improved, 16 per cent unimproved, 3 per cent as dead or dying, and 7 per cent unspecified.

As to the mortality experience of the Company, it is noted that this has constantly improved during the period for which figures could be obtained (1911–1915). In this period there was a decline of 9.7 per cent in the mortality from all causes whereas in the Registration Area there was only a reduction of 4.9 per cent. Pneumonia shows a reduction of 7.6 per cent among policyholders and of less than 1 per cent in the general population.

These gratifying results are attributed to the extensive distribution of the Company's educational literature, the coöperation with health officers and the very excellent activities of so many of the local and state departments of health. But the country-wide extension of the nursing service to include over two hundred thousand patients annually, the intensive work done often in the nature of emergent relief, the education in personal hygiene which follows the more than a million visits made by the nurses to industrial homes, together must be credited with a large share in this mortality reduction.

(*D. G.*)

New Public Health Courses.—Columbia University in New York City is offering special courses in statistics which are planned to meet present needs in the community and government service, for those taking positions in business offices, social organizations, and government work. Emphasis will be placed on procedure of investigation, methods of combining, analyzing, and presenting material, and the devices for handling and presenting data in approved form. Laboratory hours will be arranged for individual practice on problems, for accuracy tests, and for demonstration of principles. Attention will be given to the construction of graphic representations and to the use of calculating devices.

The Yale School of Medicine at New Haven, Conn., offers war emergency courses in Industrial Hygiene, designed for industrial physicians and nurses, safety managers, and others interested in industrial health and welfare. Such subjects are taken up as factory accidents, industrial poisoning, factory ventilation, lighting and sanitation, etc.

Venereal Diseases and Marriage.—The Committee on Venereal Diseases and Marriage of the American Association for Study and Prevention of Infant Mortality has made its report which is worthy of careful study.

Since an enlightened public opinion is an indispensable preliminary to further progress, strong and persistent efforts should be devoted to the task of education. The committee believes that the greatest advancement will be secured through a frank, unsentimental, scientific statement of the facts to the people. The public must learn that practically every prostitute is a center of dissemination; that there is a steady procession of these diseases from the women of the street to the women and children of the home; that the diseases in question may be conveyed through kissing and by various articles used by or on infected people, particularly implements of the kitchen, the toilet and the barber shop; that very many of the serious afflictions of later life, such as paresis, locomotor ataxia, certain forms of rheumatism, blindness, heart disease, arterial sclerosis and aortic insufficiency, as well as much general impairment of health are caused exclusively or mainly by an earlier infection of syphilis. It should be well known that early stages are usually curable, that practically all stages can be benefited by treatment, and that they can be controlled as regards contagion.

The importance of early diagnosis and intensive treatment as well as the appalling results of neglect cannot be too strongly emphasized, nor can the necessity of continuing treatment until the patient is completely cured.

As a general rule no syphilitic should contemplate marriage unless the Wassermann test remains negative after at least a year of careful treatment and continues negative after a provocative Wassermann. Inasmuch as syphilis frequently and sometimes early in its course attacks the central nervous system, it is advisable for the patient, even after the blood test continues negative, to have a test of the spinal fluid made because of the danger of a cerebrospinal form.

As to the effects on progeny, improved diagnosis shows that the transmission of syphilis to offspring is far more common than was previously thought. Not only is there a waste of potential citizens to the state by miscarriage and death twice as great in syphilitic families as in similar families which are not syphilitic, but the children which survive are likely to be shot through and through with organic defects and degenerative changes.

Urgent means are needed to compel the attendance of luetic children at the clinic until properly discharged. It is a common experience that many never are returned after the initial visit or are brought for a short period only, possibly until the acute symptoms are cleared up.—*Trans. VIII, Annual Meeting of Amer. Ass'n for Study and Prevention of Infant Mortality*, 1917, p. 92.

(*D. G.*)

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Prevention of Pneumonia.—Rufus Cole says that up to last autumn little attention was given to pneumonia as a probable menace to our newly formed army. A year ago the discussion of the subject would have been confined to a consideration of the prevention of acute lobar pneumonia due to pneumococci, but today we have entirely changed our point of view, and the acute lobar pneumonia is considered an endemic disease, while streptococcus pneumonia, which has become so prominent of late, occurs chiefly in epidemic form on account of the extreme variableness in the pathogenic properties of the streptococcus. Dr. Theobald Smith has called attention to the fact that streptococcus infections in animals are not self-perpetuating. They occur as epidemics, usually secondary to other diseases. This is also true in man. A suitable soil is needed and, this provided, the germs rapidly gain in virulence. An epidemic of measles provides the proper soil. Such an epidemic probably is unpreventable but the number of cases can be possibly limited. The time to stop streptococcus bronchopneumonia is at the beginning. Later it is extremely difficult. The measures to be taken are reviewed and especial emphasis laid on isolation. The personnel of the infectious disease hospital should be distinct from the general one, and have the facilities for still further divisions as measures of prevention of the spread of disease. The prospects of treatment of the lobar type of serum methods are sufficiently promising to warrant their thorough trial.—Cole, R., *Journal A. M. A.*, Aug. 24, 1918, p. 635.

(*D. G.*)

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A Correction.—In the July issue of the Journal on page XI we credited Dr. Lydia Allen DeVilbiss with a short poem entitled "Mary's Little Cold." We are informed that Dr. DeVilbiss is not the composer and that the latter is unknown.

✱

Effects of High Explosives Upon the Ear.—In his summary the author notes that from concussion due to high explosives there is frequently an injury demonstrable in the ear. Where the conducting mechanism is damaged or destroyed, improvement requires longer time and complete recovery cannot be expected. There may persist for a long time an inability to grasp intelligently what is said or to retain the memory of it. The outlook is good, as

a rule, especially if there is no history of marked dizziness or paralysis of face muscles nor disturbances in the patient's temperature.—J. Gordon Wilson, *Jour. A. M. A.*, August 24, 1918, Vol. 71, No. 8, pp. 628–635.

✱

The Importance of Milk and Vegetables in the Diet.—As a result of recent researches, profound changes have taken place in our idea of what constitutes a satisfactory and efficient diet. Milk is one food for which there is no satisfactory substitute. The use of milk, vegetables, green leaves such as lettuce, fruits and nuts in large amounts in the regular diet is recognized today as essential. Milk is important for various reasons. For instance the amino acid make-up of milk proteins gives them unusually high nutritive efficiency. The fat of milk has a low melting point and exists in an emulsified form. These properties are favorable to the ease and completeness of digestion. There is also a fat soluble substance which promotes growth and materially aids in promoting good health. The milk sugar is not only readily digested, but it has a favorable influence on the bacterial conditions in the intestinal tract. Milk also contains all the inorganic elements required in human nutrition. Besides possessing a fat soluble substance, milk also has another dietary essential, known as water soluble B. Milk may be used to replace meat in the diet, but the reverse cannot be practiced, if a satisfactory diet is to be maintained. A supply of at least a pint of milk per capita per day is desirable for every family.

A study of the diets of numerous families showed that there were usually deficiencies due to the inadequate use of milk, edible green vegetables, fruits, etc. The calcium content of these diets was usually low. These deficiences can always be corrected by increasing the use of milk and vegetables in the diet. The consumption of less meat and more milk is not only patriotic at present, but it aids in giving the American people a satisfactory diet.—Dr. H. C. Sherman, *American Medicine*, June, 1918. (*M. P. H.*)

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Restaurant Facilities for Shipyard Workers.—After England was in the war for a short time, it was soon realized that adequate lunch room facilities would have to be furnished to the workers at the large industrial plants if the army was to be adequately supplied with munitions and other necessaries. As a result, numerous industrial canteens were established. The benefits from these were as follows: (1) Marked improvement in the health of the worker; (2) less sickness; (3) less absence and broken time; (4) less tendency to alcoholism; (5) increased efficiency and output; (6) saving the time of the worker; (7) providing a salutary change from the workshop; (8) greater contentment of the worker; (9) better midday ventilation of the workshop; (10) increase of recreation and games in the spare time.

When the ship building program of the United States got under way, one of the serious handicaps under which the men labored was the inadequacy and poor quality of lunch room facilities. The report, written by Frederick S. Crum and published by the Industrial Service Section of the *Emergency Fleet Corporation*, represents a thorough study of the lunch room question. Numerous photographs and plans of existing lunch rooms are given. Typical menus employed with satisfaction in different plants are recorded. The construction, equipment and management of lunch rooms are also carefully considered. A special chapter is devoted to sanitation and hygiene and deals with the following topics: Location, lighting and ventilation of canteens; Necessity for adequate refrigerators; Importance of sanitary store rooms; Quality of food; Pasteurization of milk; Necessity of a pure water supply; Dish washing and general cleanliness; The health and hygiene of restaurant employees; Lavatories and wash rooms; Care and disposal of kitchen garbage and rubbish; Protection against the fly nuisance; Restaurant inspection. (*M. P. H.*)

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Education Through the "Movies."—Various cities have found the motion picture of great importance in enlightening the public regarding civic matters. The Municipal Reference Library of New York City has recently made a study of this subject, in the course of which manufacturers of educational films were interviewed, and as a result a subject list of civic motion pictures has been prepared. This list is contained in a bulletin entitled "Teaching Citizenship via the Movies," by Ina Clement. (*D. G.*)

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Rural Health Centers.—In rural or semi-rural districts it would be advisable to carry on the work for the permanent appointment of a visiting trained nurse, by interesting the officials and membership of the local Granges and Farm Bureaus. It will frequently happen that several towns can be consolidated through the efforts of the respective supervisors, the local Granges, Farm Bureaus and health officers in support of one trained visiting nurse. A center could be established under each local health officer—without unnecessary expense and without too elaborate equipment in each of the townships, and a visiting trained nurse located centrally could attend the several centers in rotation on appointed days, her other spare time being devoted to visitations in the homes. In this way the distance to each

local center from the surrounding homes would be greatly diminished, and a great conservation of time and increased attendance result. (*D. G.*)

Malaria and the Railroads.—In order to maintain a high degree of efficiency on all railroads it is of prime importance to give every possible attention to the protection of the health of railway employees. So far as malaria is concerned, there are certain steps to be taken, in addition to drainage measures. These are, the screening of outfit cars, screening of stations, the furnishing of wire at cost for the screening of employees' homes, the use of immunizing doses of quinine at all points where there are large numbers of employees who cannot be protected through the elimination of malaria infection by destruction of mosquito carriers, and the dissemination of literature on malaria.—Van Hovenberg, H. W., *Southern Medical Journal*, 1918, 8, p. 562. (*D. G.*)

Sanitary Conditions in Fort Worth, Texas.—Under the direction of Dr. J. G. Townsend, health conditions in Fort Worth are being greatly improved. After examining the public water supply and finding that safe, attention was directed against the open privy; 1600 homes have been equipped with modern sewerage facilities, and about 2,600 sanitary toilets have been installed during the past three months. Sanitary toilets are also being installed in the homes around Camp Bowie. Swamps were drained, and other precautions were taken to prevent the breeding of mosquitoes. Rubbish and garbage collection and disposal were systematized. Lunch rooms and soda water fountains were required to comply with the best sanitary practices. Food handlers were required to show medical certificates, and the common roller towel and public drinking cup had to be abandoned. The dairies were inspected, and all milk had to come up to the government standards before it could be sold. Barber shops were required to sterilize all instruments and to use individual towels. Barbers were forbidden to treat sores or pimples. Over 20,000 inoculations were made against typhoid. A venereal disease clinic was also started. As a result of this work, there has been less sickness in Fort Worth, than ever before. (*M. P. H.*)

Purification of Wastes Produced from Canning Pork and Beans.—This investigation was undertaken by the United States Public Health Service at the request of the National Canners' Association with the sewage of one of the canneries. A large volume of highly concentrated waste was produced that was causing a nuisance in the town in which the factory was located. The odors from the ditch within the town were very materially reduced by screening the wastes. A small testing station was established for experimental purposes and the results obtained proved that the wastes could be purified by passing them through a settling tank and applying the effluent from the tank on a sand filter. The settling period was approximately four hours and the rate on the filter 80,000 gallons per acre per day.—H. B. Hommon, *The Canning Trade*, 41, *No.* 51 and 52 (1918). (*Arthur Lederer.*)

Mortality from Tuberculosis Among Wage Earners, 1911–1916.—In the *Journal of Outdoor Life* for September, 1918, Dr. Louis I. Dublin of the Metropolitan Life Insurance Company, analyzes the mortality records from tuberculosis among the insured wage earners from 1911–1916. These records are analyzed according to color, age, and sex.

During the six year period, there were 110,363 deaths from tuberculosis in the Industrial Department of the Company. This represents 17.4 per cent of the deaths due to all causes in this Department. Of the 110,363 deaths from tuberculosis, 93,526 deaths or 14.7 per cent were due to pulmonary tuberculosis.

Comparing the percentage of colored to white mortality from pulmonary tuberculosis for each

sex, at specified age periods, it was found that in the age groups from 1 to 14, the colored mortality both for males and females was from eight to eleven times as great as for the whites. Although the differences become smaller in the other age groups, the colored mortality is always greater than the mortality among the whites.

Another interesting fact brought out by the study is that up to the age of 19, the percentage of white female deaths from pulmonary tuberculosis is considerably greater than for the males. The same holds true for the colored females, the age limit being 24 instead of 19. Above these respective age limits the percentage of deaths from pulmonary tuberculosis is much greater for both white and colored males. The figures for the United States Registration Area are also analyzed in the same way. Similar results are obtained; certain differences that exist in the specific age groups for both sets of figures are made apparent. The trend of mortality from tuberculosis of the lungs seems to be downward. This is particularly marked among the whites. The greatest progress seems to have been made in the age groups from 5 to 44. The greatest relative decline in the tuberculosis death rate has occurred at those ages in adult life when the rate is highest and when life is most valuable to the community. The paper opens up several lines along which further research would seem to be well worth while. (*M. P. H.*)

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Public Health Nursing Service in Extra Cantonment Zones.—As is well known, the United States Public Health Service has taken over the sanitary work in the extra cantonment zones, not only to safeguard the soldiers, but also to protect the civil population. In many cases, the work had to be organized from the earliest beginnings. A survey of the local situation was usually first made, and a definite plan adopted. Various organizations, clubs, societies, individuals and officials of local prominence were interested and funds were obtained to carry out the proposed plan of health protection.

Much attention was devoted to safeguarding the water and milk supplies, and in supervising lunch rooms and restaurants. Anti-malarial work was also carried on, in many places on a large scale. But besides these activities, public health nursing was introduced. The work of the nurse was mostly educational. There was very little time to do bedside nursing. The diseases which occupied the attention of the nurses most, were measles, pneumonia, mumps, smallpox, and meningitis. School nursing was also started in many places. In combating disease, the various officials had the services of excellent laboratories at their disposal. Venereal disease clinics were also established and much good was done along this line too. It is also planned to begin child welfare work, including prenatal and maternity care. Wherever possible the existing forces or agencies in the community are asked to coöperate.—Mary E. Lent, *The Public Health Nurse Quarterly*, July, 1918. (*M. P. H.*)

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STATE PUBLIC HEALTH NEWS.

Our readers are invited to send personal and general announcements and news items for insertion in these columns. Members entering the military service are especially included. Please send such items upon a separate sheet.

Arizona.—Dr. Orville Harry Brown has been appointed State Superintendent of Health of Arizona. Dr. Frederic T. Fahlen, Acting Assistant Surgeon, U. S. P. H. S., has been appointed Deputy Superintendent, and is in charge of the venereal disease program in the state.

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Indiana.—The Division of the Indiana State Board of Health created a Division of Venereal Diseases in June, 1917. In February, Dr. W. F. King was made Superintendent of this Division. Later Dr. King was admitted to the United States Public Health Service as Acting Assistant Surgeon. There was also added to our force Dr. Edward Helwig, Acting Assistant Surgeon, U. S. P. H. S. Dr. William Shimer, Superintendent of Pathological and Bacteriological laboratories of the State Board of Health has been appointed Acting Assistant Surgeon, U. S. P. H. S., and is now taking a special course at the Rockefeller Institute, New York. Upon his return a class for health officers in what might be termed the New Public Health will be established, the chief teaching of which will be extra cantonment sanitation and hygiene. The food and drug laboratories and the water and sewage laboratories of the Indiana State Board of Health are being remodeled and refurnished. Inspectors will be provided with automobiles and will not depend upon cars and trolleys for transportation.

(*J. N. Hurty, M. D.*)

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Illinois.—The State Department of Public Health has announced the establishment of twelve military zone health districts, each ten miles in diameter surrounding military camps and cantonments and schools and colleges in which military instruction is being given. The Department of Health will conduct special activities in these zones, particularly in regard to venereal diseases and has called upon local health authorities to observe all Federal, state, and local health laws, rules, and ordinances.

As an emergency measure to become immediately effective, the State Department of Public Health, has recently issued Rules and Regulations for the Control of Influenza making this disease reportable and subjecting infected persons to quarantine.

In the wartime tuberculosis work which is being conducted in Illinois jointly by the State Department of Public Health, the Illinois Tuberculosis Association, and the State Council of Defense, a special effort is being made to create interest on the part of the medical profession in the early diagnosis of the disease. To this end, two large clinical conferences have recently been held in Springfield, and county and district clinical conferences are now being conducted in different parts of the state.

At the annual meeting of the Illinois Tuberculosis Association, held in Springfield on September 17th, Dr. George Thomas Palmer, was elected President for the ninth successive year. The chief activities of the Association during the past year are the care of returned tuberculous soldiers who now number in excess of 1,500 in Illinois, and the direction of campaigns for the establishment of tuberculosis sanatoria, dispensaries and nursing service in thirty-four counties of the state.

The following members of the staff of the Illinois State Department of Public Health are now in military service: Capt. Paul Hansen; Capt. John A. Kappelman; Lieut. M. Warren Cowles; Lieut. George Sorgatz, M. D.; Lieut. James R. Pollock, Sanitary Corps; Mrs. Gertrude Kuhlmann; Frank Smejkal; Sergt. Earl B. Searcy; Alfred Harkness; Chester F. Clark; William J. Angsten; Harold B. Fromme; Fay Ikes.

Dr. A. E. Campbell, for the past seven years sanitarian for the Illinois Central Railway, has accepted the position of full time Health Officer for the city of Springfield.

Dr. G. G. Taylor, Chief of the Division of Social Hygiene of the State Department of Public Health, has recently made a tour of inspection of eastern and western cities in military camps preparatory to the extension of venereal disease work in the zones surrounding military camps.

(George T. Palmer, M. D.)

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Iowa.—Mr. Jack J. Hinman, Jr., Bacteriologist and Chemist for the State Board of Health of Iowa, has been commissioned a first lieutenant in the Sanitary Corps.

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Massachusetts.—Influenza apparently first reached Boston about August 25, and by the middle of September had reached epidemic proportions. On October 4, the disease was made reportable over the state, and from 6,000 to 8,000 cases were reported daily. The fatality is very high—about 5 per cent. By October 12, influenza was on the decline in Boston, only about 120 deaths being reported daily from influenza and pneumonia, as opposed to 200 when the epidemic was at its height. However, the western part of the state, which was attacked later, was becoming more seriously involved about the middle of October.

Dr. E. R. Kelley appointed two committees to study the value of an influenza vaccine prepared by Dr. Timothy Leary of Tufts Medical School. The Board of Scientific Investigation, consisting of Drs. M. J. Rosenau, D. W. McCoy and Frederick F. Gay, concluded as follows:

1. The evidence at hand affords no trustworthy basis for regarding prophylactic vaccination against influenza as of value in preventing the spread of the disease, or of reducing its severity. The evidence from the present epidemic, though meagre, suggests that the incidence of the disease among the vaccinated is smaller than among the non-vaccinated. The Board, therefore, concludes that further experimental evidence should be collected.

2. The evidence at hand convinces the Board that the vaccines we have considered have no specific value in the treatment of influenza.

3. There is evidence that no unfavorable results have followed the use of the vaccines.

The Board of Statistical Investigation reached substantially the same conclusions. It consisted of the following: Prof. G. C. Whipple, Dr. W. H. Davis, Dr. Frederick C. Crum. It was further pointed out that open air treatment and the use of face masks were effective in protecting exposed persons.

It is recommended that the distribution of influenza vaccine be encouraged for prophylactic use in order to obtain further experimental evidence, but that the State neither furnish nor endorse the vaccine at present for therapeutic use.

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Minnesota.—A localized epidemic of poliomyelitis is at present in progress at Spring Grove, Minn. Thirty-three cases have been reported thus far.

Dr. J. Arthur Ohage, for some years Health Commissioner of the city of St. Paul, was recently succeeded by Dr. B. F. Simon.

The city work house at St. Paul has recently put into operation a ward for the treatment of inmates infected with venereal disease. This is being undertaken at the present time as a part of the program for venereal disease control which is being conducted by the State Board of Health and with the coöperation of health and law enforcement authorities of the Twin Cities.

Mr. H. A. Whittaker, Director, Sanitation Divi-

sion, State Board of Health, left for France for work with the American Red Cross in September.

Dr. P. M. Hall of Minneapolis, Director of the American Public Health Association for this district, became Superintendent of the State Tuberculosis Sanitorium at Walker, August 1.

Representatives of the State Board of Health and of the State Advisory Commission on Tuberculosis Sanatoria are conducting a joint survey of tuberculosis cases in Roseau County. This is a thinly and newly settled county of large area, located on the Canadian border. The survey was undertaken in this particular area because of the known existence of unusual prevalence of tuberculosis, as compared with the general incidence of the disease in Minnesota.

During the first month of venereal disease reporting in Minnesota, the results were as follows: syphilis, 304 cases; gonorrhea, 189 cases; chancroid, 7 cases. Over two-thirds of the cases of syphilis and half of the gonorrhea were reported from Minneapolis. One hundred and twenty-seven physicians and institutions and 47 communities reported.

(*L. W. Feezer.*)

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New Hampshire.—Dr. Charles Duncan has been appointed Secretary of the State Board of Health to succeed the late Dr. Irving Watson. Previously, he was director of the State Board of Health Laboratory.

Dr. Charles A. Weuner is officer in charge of venereal disease control.

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New Jersey.—A Bureau for the Control of Venereal Diseases has recently been established by the Department of Health of the state of New Jersey and the work will be carried on in coöperation with the United States Public Health Service. Capt. J. Holmes Smith, M. D., passed Assistant Surgeon of the United States Public Health Service, has been placed in charge of the Bureau and he is assisted by Lieut. James W. Richards, M. D., passed Assistant Surgeon of said Department. Dr. Smith is busily engaged in coöperating with the local authorities in the various municipalities of the state and has already secured the establishment of a number of clinics. An extensive campaign of education will be carried on with the assistance of various civic associations and large industrial plants.

Dr. Julius Levy, of Newark, has just been appointed Consultant to the Division of Child Hygiene of the Department and the work of this Division will be reorganized and largely expanded. A number of nurses will be employed and Dr. Levy is at present engaged in outlining a plan for the successful carrying on of this very important work. The Women's Committee of the Council of National Defense, the Executive Committee of the Federation of Women's Clubs and the Executive Committee of the Parent Teachers' Association will coöperate in this work in every way possible.

(*J. C. Price, M. D.*)

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New York City.—On September 17, 1918, an amendment to the Sanitary Code, Section 86, was made to include in the reportable diseases, acute lobar pneumonia, bronchial or lobular pneumonia and influenza and requiring that such cases be segregated. Cases in hospitals were to be placed in wards and regarded with special consideration but not to be quarantined in isolation pavilions.

A circular letter has been sent to all the physicians in the City of New York calling their particular attention to these diseases and the action requested regarding them.

The following is a résumé of the statistics. Influenza not being a reportable disease there were no cases reported prior to September 19, 1918, on which date the letter containing this information was sent to physicians.

September 19, 47 cases of influenza.

September 20, 30 cases of influenza.

September 21, 20 cases of influenza.

September 23, 85 cases of influenza (including Sunday).

September 24, 42 cases of influenza.

The above is exclusive of cases in military cantonments. The Bureau of Vital Statistics of this Department reports deaths for the week ending September 14, and September 21, as follows:

	Lobar pneumonia	*Broncho pneumonia*	*Influenza*
September 14.....	44	30	2
September 21.....	67	31	8

Under separate cover, I am sending you a photographic copy of one of two public notices which were distributed broadcast by means of placards. They were posted up in railroad stations, ferry houses, public schools, public buildings, etc., etc.

In order to centralize the field activities and provide for the citizens easier access to the various offices of the Department, the Commissioner of Health on October 1, 1918, will abandon all bureau control in the field and return to the form of control called for by the Charter requiring an assistant sanitary superintendent in charge in each borough. Commencing October 1, 1918, under the control of Sanitary Superintendent, Dr. Frank J. Monaghan, the control of the several offices in the different boroughs will be as follows:

Manhattan: Dr. Alonzo Blauvelt, Assistant Sanitary Superintendent.

Brooklyn: Dr. Herman T. Peck, Assistant Sanitary Superintendent.

Bronx: Dr. Arthur T. O'Leary, Assistant Registrar and Acting Assistant Sanitary Superintendent.

Queens: Dr. John F. Barry, Assistant Sanitary Superintendent.

Richmond: Dr. Edward T. Wisely, Medical Inspector and Acting Assistant Sanitary Superintendent. (*S. Dana Hubbard, M. D.*)

Mr. Arthur S. Bedell, of Albany, N. Y., leaves this country as sanitarian on the Red Cross Mission to Greece.

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North Carolina.—Through the efforts of the Bureau of Medical Inspection of Schools of the State Board of Health two counties of the state have arranged for the installation of permanent dental clinics for the benefit of the school children.

The clinics are to be operated through the coöperation of the counties and the State Board of Health, the expenses to be shared jointly. A splendid dental equipment, with all necessary supplies, is provided and attractive offices will be fitted up in rooms assigned in the court houses.

These permanent county dental clinics, like the traveling clinics now in operation in a number of counties in the state, are a part of the follow-up work of the medical inspection of schools.

It is the plan of the State Board of Health to have a circuit of four counties for the permanent clinics with one dentist in charge having a fixed itinerary. By this means the expense for a year after the equipment is installed to a county will be only $600, and half of this is to be paid by the state. The dentist would divide his time equally between the four, giving each a month in rotation.

Inspectors of the State Board of Health have completed the inspection of forty-eight of the one hundred county jails of North Carolina as provided by an act of the legislature of 1917. A tabulation of the reports shows that very few jails of the state are maintained according to the sanitary rules and regulations adopted by the State Board of Health for the protection of the physical well-being of the inmates. (*D. G.*)

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Ohio.—The State Department of Health has announced its readiness to assist any manufacturing establishment in the state to decrease the ravages of venereal disease among its employees. There will be furnished educational posters for use in the plant, circulars of information on venereal disease for distribution among the men, enclosures for use in pay envelopes, and representatives of the Department to give illustrated talks. It is realized that industrial plants whose continued operation at highest efficiency is so important a matter in time of war, offer one of the most fruitful fields for work in venereal disease prevention. (*D. G.*)

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Pennsylvania.—The Department of Health of the Commonwealth of Pennsylvania has extended its Genito-Urinary Dispensary system to a chain of thirty-two dispensaries operated in the various industrial and populous centers of the Commonwealth and is coöperating closely with the Courts and with the United States District Attorneys in handling criminals and quasi-criminals and keeping them under supervision until certified by Department officers as free from infection. The following physicians have so far been appointed as Chiefs of these dispensaries in the places enumerated:

Dr. George J. Muellerschoen, Philadelphia.
Dr. Charles P. Henry, Reading.
Dr. John M. Oenslager, Harrisburg.
Dr. Edward Lyon, Williamsport.
Dr. P. P. Mayock, Wilkes-Barre.
Dr. Charles Rea, York.
Dr. C. H. Witmer, Lancaster.
Dr. H. O. Jones, Altoona.
Dr. Robert L. Schaeffer, Allentown.
Dr. John B. Cressinger, Sunbury.
Dr. Frank C. Garvey, Scranton.
Dr. W. D. Chase, South Bethlehem.
Dr. James C. Burt, Pittsburgh.
Dr. Benjamin A. Bealor, Shamokin.
Dr. Herman D. Boyles, New Castle.
Dr. P. P. Fisher, Sharon.
Dr. H. P. St. Clair, Butler.
Dr. Seth A. Light, Lebanon.
Dr. William O. Lubken, Johnstown.
Dr. M. C. Householder, Pottsville.
Dr. J. J. Condran, Easton.
Dr. John Steel Anderson, Greensburg.
Dr. Edward H. Drozeski, Erie.
Dr. J. P. Strayer, Oil City.
Dr. M. A. Neufeld, Chester.

Dr. Charles M. Rickert has been appointed Assistant Chief Medical Inspector in the Department of Health.

Dr. J. L. Seibert of Bellefonte, Center County, has been appointed to act as County Medical Inspector of that County during the absence of Dr. S. M. Huff who has gone into Service.

Dr. A. H. Smink of Shamokin, Northumberland County, has been appointed to act as County Medical Inspector of that County during the absence of Dr. R. H. Simmons who has gone into Service. Dr. Clarence Malone was formerly Acting C. M. I. of this County; he has also gone into Service.

Dr. Robert Barckley of Milford, Pike County, has been appointed to act as County Medical Inspector

of that County during the absence of Dr. W. B. Kenworthy who has gone into Service.

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Washington, D. C.—Dr. Harry S. Bernton, pathologist to the State Board of Health of Rhode Island, has resigned to become the chief of the Bureau of Preventable Diseases and director of the biologic laboratories of the Health Department of the District of Columbia.

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Wisconsin.—A smallpox and scarlet fever scare at Glidden, Ashland County, recently led to the general vaccination of school children and other preventive measures by the Board of Health.

Pollution of the city water supply of Washburn, derived from Lake Superior, has been found by state analysis. The State Board of Health has ordered chlorination.

The report of chemists on the condition of the Milwaukee city water supply found its bad taste was due not to chlorine but to the action of the chlorine on coal tar products in the water. Further findings attributed the presence of coal tar products to waste from industrial plants. Elimination of this waste from the water supply has since been sought in conference with the manufacturers, who agreed to provide septic tank treatment or other approved means for avoiding further pollution.

The State Coöperative Laboratory of Hygiene at Superior has been directorless for some time owing to the enlistment of William Strasser, and efforts to fill the place have been vain because of the demand for chemists and bacteriologists in war work. The same situation obtains at Wausau.

No contagious disease had been reported in Eau Claire for more than a month, according to a report on September 1.

The quarantine of southern Wisconsin counties for rabies, instituted last spring, has greatly lessened cases of rabies in that section, but has been extended for an indefinite period.

Eleven college women have been accepted for the limited class organized for the new training course in public health work established by the Wisconsin Anti-Tuberculosis Association at Milwaukee. This course, designed to equip well educated young women for health work in schools, city health departments, laboratories, etc., for the fight against preventable disease, is said to be the first of its kind in the United States. The scholarships for the course have been granted to Mrs. Cora Froehlich, the Misses Erna Suttinger, Cora A. Brockhausen and Margaret Hennessey, Milwaukee; R. Claire White, Madison; M. Josephine Conlin, Columbus; Lela Bennett, Lancaster; Helen Corsaw, Union Center; Alvina A. Klein, Weyauwega; Mercy A. Rockwood, Oshkosh, and Ruth R. Forbes, Pontiac, Ill.

Reorganization of the Racine Health Department on modern lines was recommended officially by the new assistant health commissioner, Dr. H. L. Wilson, who proposed that all health activities be placed under this department; that the health commissioner be made the official head of the department; that he be a physician, appointed by and responsible to the Board of Health; that the department consist of a health commissioner, a clerk, a woman dairy and food inspector, a quarantine officer, two sanitary inspectors, and six nurses; that school health inspection, clinics for indigent children, an infant welfare station, tuberculosis dispensary, and modern isolation hospital be established.

(*L. W. Bridgman.*)

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Health Mission to Italy Under Red Cross Auspices.—The mission will sail for Italy to conduct a health campaign in that country with the stamping out of tuberculosis as its particular objective. The unit will be under the supervision of Col. Robert Perkins, Red Cross commissioner for Italy. Included in the personnel of the unit, which numbers sixty persons, are many of this country's best-known tubercular specialists, as well as physicians who have been very successful in the lines of work which they will be called upon to perform. The director of the unit is Dr. William Charles White, of Pittsburgh. Others are:

Dr. John H. Lowman, professor of clinical medicine at Western Reserve University, Cleveland, chief of the medical division; Dr. Louis I. Dublin, of New York, statistician of the Metropolitan Life Insurance Co., chief of the division of medical statistics; Dr. Richard A. Bolt, of Cleveland, connected with the health department of that city, chief of child-welfare division; Dr. E. A. Paterson, of Cleveland, chief of division of medical inspection of public schools; Dr. Robert G. Paterson, of Columbus, Ohio, head of the tuberculosis branch of the State Health Department, chief of the division of education and organization; Miss Mary S. Gardner, head of the bureau of public-health nursing of the American Red Cross, chief of division of public health nursing.

The executive manager of the organization is Lewis D. Bement, of Framingham, Mass.

Dr. C. F. Bolduan, formerly director of the Bureau of Health Education at New York City is now in a similar capacity with the United States Public Health Service. (*Arthur Lederer, M. D.*)

INDUSTRIAL HYGIENE AND OCCUPATIONAL DISEASE

Abstracted by Drs. E. R. Hayhurst, R. P. Albaugh and P. M. Holmes.

Uniform Occupational Disease Act.—A draft of an act relating to compensation for industrial disease, intended as a supplement to their draft for a uniform workman's compensation act, was included in a report of a Special Committee on Occupational Diseases (in the Ninth Annual Report) of the Board of Commissioners for the Promotion of Uniformity of Legislation in the United States. The draft submitted follows closely the provisions of Section VIII of the British Workmen's Compensation Law of 1906 and provides only for the compensation of "those relatively few diseases to which the public at large, generally speaking, is not subject, which are attendant upon and peculiar to specific industrial processes and for which the industry itself is wholly or principally responsible." The draft, as arranged, excludes tuberculosis and other non-specific occupational diseases, saying that there is already a movement started looking toward the care of this "larger class of occupational diseases" by what is called health insurance.—*Monthly Review, U. S. B. of L. S.*, June, 1918, pp. 219–221.

Examination of Men Entering the Aviation Corps.—The author has devised a hermetically sealed cabinet with an exhaust pump and gauge by which conditions of sudden change in air pressure, such as occur to the aviator, can be duplicated in the cabinet. The man is first given the usual physical tests as to pulse, blood pressure, muscular tone and effects of rotation. He is then placed in the cabinet and the air exhausted at the rate of "1,000 feet altitude per minute until he has reached a height of 6,000 feet." He is kept in this rarifaction (which represents altitude) for a given length of time. In trying men who had flown, it was determined that the sensations they experienced in the cabinet were exactly similar to those they had had in actual flight, such as the pain experienced in the ears and head. More work along this line is advocated as one of the best methods of testing out applicants for the aviation service.—C. M. Robertson, *Jour. A. M. A.*, September 7, 1918, Vol. 71, No. 10, pp. 813–817.

Mortality From Respiratory Diseases in Dusty Trades (Inorganic Dusts).—This 458-page bulletin sums up the principal literature as well as the actuarial experiences and statistical publications having to do with the features in the title. So far as can be seen, all phases of the question as regards, cause, extent, effect and correction are portrayed with careful detail with a free acknowledgement of sources of information. Naturally, the discussion has most to do with pulmonary tuberculosis in its industrial relations. The various occupations exposing to metallic dust take up pages 51 to 161. The general conclusion is that the death-rate from all causes and the specific death-rate from pulmonary tuberculosis among men is decidedly excessive at all ages and extremely high during the age period 25–54. Exposures to mineral dust occupy pages 163–322, where, among general conclusions, it is stated that the proportionate mortality from pulmonary tuberculosis and other respiratory diseases is excessive at all ages, while that for non-tuberculous respiratory diseases is decidedly excessive for the older ages. The mineral industries (mines, quarries, ore reduction and smelting) are considered separately and conclude the bulletin with the exception of some final pages on general observations and conclusions. With respect to coal mining an appeal is made for future investigations, both medical and statistical, with due regard to more exacting requirements, so that the existing amount of more or less misleading information may be replaced by trustworthy data and conclusions which bear the stamp of scientific accuracy.—Frederick L. Hoffman, *Bull., Whole No.* 231 (*Industrial Accident and Hygiene, Series No.* 17), June, 1918, *U. S. B. of L. S.*, Washington, D. C.

Want Medical Examinations for Industrial Workers.—Samuel Gompers, as chairman of the Committee on Labor of the Council of National Defense, has recommended to Secretary of Labor Wilson that medical examinations of industrial workers be made one of the functions of the Government's labor recruiting agencies. Accompanying the recommendation is a proposed standard card to be used in making physical examinations. These cards deal with such subjects as laboratory diagnosis, previous occupations, general appearance as relating to deformities, malnutrition, diseases of the eyes, ears, nose and throat, lungs, heart, nervous system, hernia, hemorrhoids, venereal disease, etc. Mr. Gompers' committee further recommends the establishment of a central examining board composed of representatives of the workers, employers, and the Government. It is believed by some that this is opening the way to the early adoption of social health insurance.—News of the Week, *Medical Record*, September 7, 1918, page 421.

Child Labor Bill.—A bill has been introduced in Congress to take the place of the Federal Child Labor Bill recently declared unconstitutional by the Supreme Court. It is said that the bill embodies the standards of the old law very closely, prohibiting the labor of children of less than 14 years at any time, of children between the ages of 14 and 16 years for more than eight hours a day, of child labor at night in factories, and of children of less than 16 years of age in mines and quarries. The bill is based on the war power of Congress to conserve the man-power of the Nation, while the old law was based on the power of Congress to regulate interstate commerce. If the bill becomes a law it will prohibit the employment of children during the war and for a period of six months thereafter.—*Medical News, Jour. A. M. A.*, September 21, 1918, p. 988.

Swiss Social Insurance and Accident and Disease in Workers.—In the case of accidents Zangger places great importance on the first examination of the case since it often becomes practically impossible for malingering to be detected later. This first examination should include specifications of the status of the person at that time in respect to the cause, outlook and treatment of his injury as well as data on pre-existing disease. The Swiss legislation goes beyond any other in the world in accepting certain sick conditions without visible manifestations as accidents entitling to compensation. In the hands of the physician is placed the chief authority as to the cause of the sickness, as the workman himself very seldom knows what is inducing the trouble and he usually regards as poisonous only substances that smell bad or induce nausea. Sickness, which is exclusively or predominantly traceable to a poisonous substance, ranks with industrial accidents in the Swiss law.—Abstracted by *Jour. A. M. A.*, August 24, 1918, Correspondenz-Blatt für Schweizer Aerzte, Basel.

Lighting Code.—The New York State Department of Labor has formulated a code relating to the lighting of factories and mercantile establishments, which became effective July 1, 1918, and provides for minimum intensities of light in terms of foot-candles for various kinds of work and various parts of industrial establishments. In an appendix, recommendations are made regarding daylight. The various illumination hazards such as glare, brilliancy, etc., are warned against. In addition to the minimum intensities outlined, a table of desirable standards of illumination is given and also a table of minimum intensities for detailed industrial operations and processes. The code has the effect of a law and a penalty is provided.—*Bull. No. 18, N. Y. State Dept. of Labor*, 15 pp.

Labor Turnover.—Douglass gives several ways of determining labor turnover and for computing this rapid change in personnel even in the face of growth or decay in an industry during the year. The term is a difficult one to define but in general means the number of replacements (separations) which take place in the average working force for a given length of time. Natural turnover due to deaths, estimated at 1 per cent per year, industrial accidents, sickness, and other causes would not be responsible for more than 5 or 6 per cent. Returns from certain large establishments have shown as high as 416 per cent. Turnover for juvenile labor is especially high. Labor turnover is not always an economic waste to the employer for, in the past, wornout or exhausted workmen could be discharged and new ones employed. It is, of course, poor economy from the standpoint of social efficiency. The principal items that enter into the cost of employing new men are: (1) the clerical cost of hiring and firing; (2) the cost of instruction; (3) decreased production by the new worker, which is noticeable continuously where a rapid shifting occurs; (4) breakage and damage caused by new men; and (5) cost of idle machinery where positions are not immediately filled. These vary greatly as to the skill of the workmen concerned, from $8.50 for unskilled laborers to $73.50 for those operatives who require a few months for the proper degree of efficiency. The cost to the Ford Company for 1913 is estimated at $2,000,000. The chief causes for unnatural labor turnover are: (1) poor methods of employment and discharge; (2) poor methods of promotion within the factory; (3) seasonal nature of many industries; (4) juvenile labor; (5) the monotony of modern factory work; (6) low wages, causing workers to regard jobs as makeshifts until they can find others. The remedy lies in employing a specialized employment department which should begin with: (1) physical examination of new employees; (2) a system of follow-up work including a show of friendly interest and an inspection of working conditions and of absence records; and (3) an investigation of the reasons for the successes and failures of individual workmen. A well-defined promotion policy is essential. The department foreman should be stripped of his employment functions and allowed to concentrate his attention upon the actual production of goods. The centralized employment department enabled the Ford Company to decrease its turnover from 416 per cent to less than 80 per cent. Profit-sharing is another method of insuring greater permanence of labor.—Paul H. Douglass, *Amer. Econ. Review*, June, 1918, pp. 306–316.

Prevention of Industrial Anthrax. The British. Departmental Committee appointed to inquire into the best methods of preventing the danger from anthrax infection arising in the handling of wool, goat-hair and camel-hair has recommended the following procedure:

1. A preliminary process, in which the material is submitted to the action of a warm solution of soap in water containing a little alkali, followed by squeezing through rollers for the purpose of causing disintegration of blood clots, removing all protection from the spores and bringing the latter into a condition in which they are susceptible to the action of disinfectants.

2. Disinfection, in which the material already treated by the preliminary process is submitted to the action of a warm solution of formaldehyde in water and again squeezed through rollers, most of the spores being destroyed at this stage.

3. Drying, by which all the surviving spores are killed, except in exceptional circumstances.

4. Standing for a short time in order to ensure destruction of any spores which, from being exceptionally well protected, may have survived the previous part of the process.—*Lancet*, June 15, 1918, p. 848. (*D. G.*)

Tuberculosis an Occupational Disease?—Infection in tuberculosis takes place in early life and we go through life with the germs in our bodies; but whether or not we succumb depends upon our surroundings, the conditions of our work, and upon our resistance. This resistance may be broken down in many ways. A connection can perhaps be shown between dust in certain industries and this broken down resistance so as to bring the resulting tuberculosis under compensation laws. This has been done in California and should be done elsewhere. Again, resistance may be broken down by excessive fatigue. A low wage scale resulting in poverty is a great cause of tuberculosis.—Abstracts from remarks made by Dr. Alice Hamilton at a Conference of Health Insurance Commissioners in Cleveland, *Hospital Management*, July, 1918, Vol. VI, No. 6, pp. 38–40.

The Sufferer From Tuberculosis Should Not Work.—The person suffering from tuberculosis who has a maximum daily temperature habitually exceeding 1 degree (99.5 F.) should unquestionably be kept in bed. As has been well said, the patient who begins to exercise has reached a period of danger in his course of treatment.—*Amer. Review of Tuberculosis.*

Heat Stroke and Cerebral Edema.—Heat stroke occurs as a result of several factors, chief among which is the inability of the air about the body to receive any more moisture because it is already saturated, together with a high temperature of the air. This applies to heat stroke caused by exposure to the sun's heat and also to heat stroke occurring under other conditions, such as hot kitchens and boiler rooms. Less important causes are tight and heavy clothing, and too small intake of water and the excessive consumption of alcohol. The possibility of infectious origin is discussed. The symptoms are outlined and the pathologic anatomy discussed and particular emphasis laid on the appearance of cerebral edema in cases coming under the authors' observation.—McKenzie and Le Count; *Jour. A. M. A.*, July 27, 1918, p. 260

Sunstroke, Disease or Injury?—The Oklahoma Supreme Court holds that in a case of sunstroke, suffered while the victim was engaged in his usual avocation and when the victim did not intentionally subject himself to an intense heat calculated to produce sunstroke, the affliction was an accident within the meaning of an insurance policy which provided that "if sunstroke, freezing or hydrophobia, due in either case to external, violent or accidental means, shall result, independently of all other causes, in the death or injury within 90 days from the date of exposure or infection, the company will pay said principal sum as indemnity for loss of life."—*Medico Legal Notes*, *Medical Record*, September 21, 1918, p. 506.

Freezing is an Accident; Also Heat Stroke.—These opinions rendered by the Supreme Court of Minnesota are abstracted in the Medico Legal Department. The Court sustained the view that the incident of freezing which occurred to a workman in the woods who was not permitted to build a fire, arose out of the employment and came under the compensation laws. References to similar decisions in cases of heat stroke are given.—*Jour. A. M. A.*, May 11, 1918, Vol. 70, No. 19, p. 1397.

Changes in the Brain in Carbon Monoxide Poisoning.—Hill and Semerak made studies of 32 brains obtained from the post mortem rooms of Cook County Hospital, Chicago, which were chosen only by the one circumstance, that death was due to carbon monoxide poisoning. They found that there is a characteristic type of injury produced in the brain by this cause which can be identified by the pathologist ("namely a bilateral ischemic necrosis of the lenticular nucleus, especially the globus pallidus"). Nerve cells, in themselves, possess a high degree of tolerance to the poisonous action of carbon monoxide. That such poisonings are a cause for the subsequent development of nervous and

mental diseases as well as for deaths which may not be explained easily, received emphasis from this study.—Emery Hill and C. B. Semerak, *Jour. A. M. A.*, August 24, 1918, Vol. 71, No. 8, pp. 644–648.

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Mental Symptoms of Carbon Monoxide Poisoning.—Memory defect stands out as the most important nervous symptom following the inhalation of carbon monoxide. It is pointed out that the brain of a soldier, dead from shell shock, and the brain of a man, dead from carbon monoxide poisoning, show a marked similarity, particularly in the corpus callosum which shows numerous capillary punctate hemorrhages. Five cases are cited and discussed.—C. W. Hitchcock, *Jour. A. M. A.*, July 27, 1918, pp. 257–259.

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Cyanamid Poisoning (Artificial Fertilizers).—Langlois calls attention to the serious danger for workers on calcium cyanamid if they take an alcoholic drink. A small glass of wine is liable to send the pulse up to 104 and the blood pressure extremely low with rapid breathing. The man, in a typical case described, had a fainting spell after drinking about one ounce of red wine. The spell returned whenever he raised his head, and nausea and extreme reddening of the face and eyes were pronounced. The blood pressure kept very low for an hour, but by the end of the eighteenth hour there were no further signs of disturbance.—Abstracted by *Jour. A. M. A.*, September 7, 1918, p. 858, from Bulletin de l'Académie de Médecine, Paris. (Langlois' findings are in line with those of one of us—Hayhurst—reported in 1915 in the "Ohio Survey of Industrial Health Hazards and Occupational Diseases," page 349, where, in the mixing and grinding of certain fertilizers, "one workman claimed that there was a peculiar effect produced by the drinking of beer while breathing cyanamide dust which caused headache, giddiness and nausea.")

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How Industrial Fatigue May Be Reduced.—The Divisional Committee on Industrial Fatigue (Council National Defense) notes the following ways of detecting fatigue: (1) Amount of output, by keeping a record of the employees' work by the hour or day; (2) amount of power used; (3) certain indicators such as the amount of spoiled work, the number of accidents, the number of absences, and, in extreme cases, by records of sickness; and (4) laboratory tests of fatigue. The ways of reducing fatigue are summarized as (1) introducing recess periods with perhaps a little food or a cup of tea or cocoa; (2) introducing variety into the work; (3) adjusting the speed of machinery to the average pace of the workers and transferring workers who are especially fast or slow to other work; (4) omitting unnecessary motions as in reference to height and distance which articles must be moved by the hand; (5) providing adjustable seats, perhaps with foot rests; (6) ventilation of work rooms, especially in reference to avoiding excessive heat and humidity, which puts the body in a feverish state. "It is astonishing how easily a comfortable and refreshing bodily condition may be maintained by the use of electric fans"; (7) sanitary conditions within factories, including lighting, exhaust systems for dust and fumes, proper drinking facilities, rest rooms, especially for women, canteens, and clean, well-ventilated, modern toilets; (8) alternating day and night work. The day sleep of night workers is likely to be curtailed and thereby fatigue produced in this group of workers. Studies show that where night work is unavoidable, workers should be alternated at intervals between day and night, the periods to be not less than one month in duration; (9) adjusting hours of work. This is particularly in the direction of decreasing 12 and 10 hour workdays, although the exact relationship between length of day and quantity of output is not yet fully investigated for all conditions, but the great preponderance of evidence favors a reasonably short working day even in the interest of the industries themselves; (10) avoiding overtime, or where necessary, not for many days in succession; (11) omitting Sunday work; (12) controlling sanitary conditions outside factories. In conclusion the Committee states "should any industrial corporation that is now engaged in manufacturing war supplies desire the services of the Committee, communications should be addressed to the Executive Secretary at the office of the Committee, 437 West 59th Street, New York City."—*Public Health Reports*, U. S. P. H. Service, August 16, 1918, Vol. 33, No. 33, pp. 1347–1355.

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Trinitrotoluene Poisoning.—The London correspondent dwells upon a remarkable feature of this disease in the length of time that may elapse between absorption of the poison and the development of jaundice or anemia. The most extreme case reported was that of a woman, who, after two months' work in processes in the manufacture of this explosive, was transferred to another department. Over seven months later a spanner fell on her head. Toxic jaundice developed a week later and proved fatal in a fortnight. Exhaust ventilation locally applied proves to be the best prevention in the workplace. Gloves were reported as more of a source of danger than a safeguard. Respirators proved an impracticable remedy.—*Jour. A. M. A.*, August 24, 1918, Vol. 71, No. 8, pp. 678.

PUBLIC HEALTH LABORATORY NOTES

Abstracted by ARTHUR LEDERER, M. D.

Method of Preparing Medium for Culture of Influenza Bacillus.—The method consists in the use of blood digested by trypsin. The blood used need not be fresh, but may be well citrated blood that has been kept in an ice chest. The medium grows influenza freely from the first culture and it is to a marked extent selective. Thus it inhibits pneumococci entirely and in a large measure streptococci and other Gram-positive organisms, but apparently favors staphylococci. The colonies of influenza bacilli on initial culture attain a large size.—John Matthews, *Lancet* (*London*), 195, 104 (1918).

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The Growth of Bacteria in Protein—Free Enzyme and Acid-Digestion Products.—Apparently the first protein-free medium which compared favorably with the universally used peptone medium was the opsine studied by Dalimier and Lancereaux (Presse Med. 21, 419). Opsine is a biuret-free product resulting from the combined action of trypsin, erepsin and pepsin on certain protein materials. Glycerol and agar added made a very successful medium for even the most delicate organisms. The authors substantiated these claims made originally. Opsine proved superior to Witte's peptone. A reaction slightly alkaline to litmus was found to be best for general use. The opsine was obtained from Paris. It resembles highly concentrated commercial meat extract. The addition of 0.5 per cent Liebig's meat extract to neutral opsine agar yields superior results.—Harold C. Robinson and Leo F. Rettger, *Jour. Bact.*, 3, 209 (1918).

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Intradermal Vaccination against Smallpox.—A comparative study of 227 cases, with all conditions equal, showed that vaccination by the intradermal method gives a much higher percentage of "takes" than vaccination by the incision method. There is less chance for infection and it is the only method by which a fair index of the relative immunity of persons to smallpox may be obtained.—L. T. Wright, *Jour. Am. Med. Assoc.*, 71, 654 (1918).

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Further Experiences with Brilliant Green Agar and Other Mediums for the Isolation of the Typhoid Group from Feces.—The brilliant green medium has markedly increased the number of positive fecal examinations for typhoid and paratyphoid bacilli. The methods of preliminary and final identification previously recommended have been found reliable. The essential point in the success of the medium is proper standardization. Of the recently suggested non-restraining plating mediums, Robinson and Rettger's modification of the Endo agar has given a far superior contrast between lactose and non-lactose fermentative types than that obtainable with the various modifications thus far tried.—Charles Krumwiede, Jr., L. A. Kohn, A. G. Kuttner and E. L. Schumm, *Jour. Inf. Dis.*, 23, 275 (1918).

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Studies on Bovine Mastitis.—Hemolytic streptococci produce more or less severe inflammations of the udder of cows. The streptococci isolated from the invaded quarters have produced clear zones of hemolysis immediately surrounding the colonies when cultivated in horse blood agar plate cultures. The streptococci fall into two broad groups according to their action upon carbohydrates. All streptococci except three were agglutinated by an antiserum obtained from a rabbit immunized with a single strain. Freshly isolated cultures when injected intravenously into rabbits possess but slight pathogenicity.—F. S. Jones, *Jour. Exp. Med.*, 28, 253 (1918).

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Active Immunization of Infants against Diphtheria.—Zingher would have all infants below twelve, and if possible below eighteen months of age, actively immunized with three doses, each 10 cc. of toxin-antitoxin, one week apart. These injections should be given irrespective of the Schick test the infants may show at the time of immunization. The injections are given subcutaneously in the arm or below the angle of the scapula, and repeated every seven days. All children over eighteen months of age, as well as all youths and adults, should be tested with the Schick reaction first, and only those giving a positive reaction immunized with toxin-antitoxin. The mixture used should be slightly toxic and should represent about 85 per cent of a lethal plus to each unit of antitoxin. The active immunization against diphtheria should be carried out first of all by the private physicians in the different homes, where a majority of the infants can be reached. In cities of large population the milk stations, day nurseries, children's dispensaries,

infant and orphan asylums furnish large groups of children suitable for immunization.—A. Zingher, *Am. Jour. Dis. Children*, 16, 83 (1918); *Jour. Am. Med. Assoc.*, 71, 849 (1918).

Complement Fixation with Specific Antigen in Acute Poliomyelitis.—The author describes the mode of preparation of the antigen and procedure of fixation test. One hundred and fifty-two spinal fluids and 60 blood serums were examined; 53.5 per cent gave a positive, 27.9 per cent a doubtful, and 9.5 per cent a negative reaction. It would appear that an antigen has been found which probably is specific and fixes complement, hence of positive diagnostic value in poliomyelitis.—M. Neustaedter, *New York State Jour. Med.*, 18, 328 (1918).

Improved Technic for Embedding in Paraffin.—The author accomplishes the same purpose as the usual water and alcohol technic by placing the specimen—dried between blotting paper and not rinsed—directly in the mixture consisting of 10 parts of pyridin, 40 parts chloroform and 50 parts acetone. These ingredients are mixed cold beforehand; the amount used is about twenty times the volume of the specimen. The latter is suspended by a thread in the mixture in a test-tube or other vial, and is left in the fluid for from ten minutes to one hour according to size. The fluid is then poured off and fresh used for a second bottle for the same length of time. The specimen is then transferred directly into the paraffin. Specimens treated by this rapid method take stains as usual, and the specimens keep perfectly.—C. Dunet, *Lyon Medical*, 127, 256 (1918); *Jour. Am. Med. Assoc.*, 71, 859 (1918).

Continued Elimination of Bacilli Following Typhoid Fever.—Carriers of the paratyphoid A and B bacilli react in the same way as typhoid carriers. The passage of the bacilli from the gall-bladder into the intestine is usually periodic. On the other hand, rectal elimination is generally continous and in large quantity. The paratyphoid B organism is rarely eliminated by the kidney. Some subjects carry the organism in the throat. Most of the carriers have had at some time in their history a typhoid fever or some septic affection. The continued elimination of bacilli tends to become permanent for months or years, and about 25 per cent of the subjects recover spontaneously during the first six months following their recovery. Cholecystitis is to be regarded rather as a result of microbic elimination than the cause. The entire number of carriers should be estimated at from 3 to 5 per cent of those who have suffered from the disease.—Reibmayr, *Muenchener med. Wochenschrift*, June 18, 1918; *Medical Record*, 94, 427 (1918).

Bruck's Reaction with Serum and Cerebrospinal Fluid.—The test was applied with the serums of 100 persons, the majority of whom were under treatment for syphilis. Wassermann and Bruck tests with 94 serums (the Bruck tests being conducted with fresh active serums) yielded similar results with 65 serums, or about 70 per cent. The Bruck test was found to yield presumably about 8 per cent falsely positive reactions. The active serum is better adapted for the test than inactivated serum.—I. Toyama and J. A. Kolmer, *Jour. Cutan. Dis.*, 36, 429 (1918); *Jour. Am. Med. Assoc.*, 71, 928 (1918).

Bacteriological Methods for Determining the Quality of Milk.—The reaction of the agar used in plating the milk for bacteriological count influences the results obtained considerably and in order to standardize the method, it is recommended that the agar be made up with a reaction of 0.5 acidity. Experiments were carried out at four degrees of acidity—0, 0.5, 1.0, and 1.5, and in nearly every instance the highest results were obtained at 0.5 acidity. Several references to the literature on this subject are given.—J. M. Sherman and F. P. Reynolds, *Penn. State Coll. Expt. Sta. Ann. Rep.*, 1914–15, p. 294; *Chem. Abst.*, 12, 1569 (1918).

Volumetric Determination of Calcium in Water.—The sample of water is shaken with an excess of 8 per cent ammonium oxalate solution and allowed to stand ten to fifteen minutes; filtered through a dry filter into a dry receiver. An aliquot part of the filtrate is acidulated and titrated with 0.1 N potassium permanganate. A "blank" is run with distilled water using the same pipette to determine the total reducing value of ammonium oxalate in the aliquot used. From the difference in permanganate used the calcium content is calculated.—Grossfield, *Z. Nahr. Genussm*, 34, 325; *Chem. Abst.*, 12, 1578 (1918).

A Prophylactic and Curative Serum for Weil's Disease.—A serum has been prepared whose curative virtue is considered absolute. It has been noted that the blood-serum of animals and man infected with icterogenous spirochete contains antibodies which persist for seven months, two and one-half years or even twenty years after recovering from the disease. The method of preparation of the serum is given. The serum has a distinct curative power when injected at the beginning of the disease, before icterus has appeared, if employed in the dose of 50 cc. injected into the muscle or intravenously.—

Uhlenhut and Fromme, *Deutsche med. Woch. schrift*, June 27 (1918); *Med. Rec.*, 94, 472 (1918).

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Wasserman Test.—A full description of the Wassermann test in use at the Hygienic Laboratory of the United States Public Health Service appeared in *Public Health Reports*, Aug. 23, 1918. The article was prepared by M. H. Neill, Passt Assistant Surgeon, U. S. H. S.

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Determination of Albuminoid Ammonia in Liquids Containing Gas-liquor.—Thiocyanates must be removed before albuminoid ammonia can be determined in liquids containing gas-liquor, since thiocyanate yields ammonia when heated with alkaline permanganate solution. A definite volume of the sample (which should be alkaline) is treated with a quanity of aluminium sulfate sufficient to give a decided precipitate, filtered through an asbestos filter, the filtrate acidified with nitric acid, the thiocyanate precipitated by the addition of silver nitrate, and the mixture again filtered. The filtrate is then distilled in the usual way. A control determination should be made in distilled water to which a small quantity of thiocyanate has been added and a corresponding correction applied to the results obtained; the correction is practically constant.—H. F. Stephenson, *Analyst*, 43, 215 (1918); *Jour. Soc. Chem. Ind.*, 37, 439a (1918).

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Toxic Action of Carbonic and Other Weak Acids on the Meningococcus.—The meningococcus survives exposure to Ringer-Locke solution. Sodium bicarbonate (0.02 and 1.0 per cent) in sodium chloride solution exerts a toxic effect on exposures of 60 minutes; a 2 per cent solution has no toxic effect. The toxic action of serum through which carbonic acid gas has been passed is pronounced. It is suggested that normal solutions containing increased amounts of carbon dioxide, or lactic acid may as physiological antiseptics be employed in the local treatment of areas infected with meningococci, and that even the carbon dioxide normally occurring in the plasma and body fluids may form part of the protective processes of the body.—J. A. Shaw-Mackenzie, *Jour. Royal Army Medical Corps*, 31, 1 (1918).

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Value of the Wassermann Reaction.—A comparison of the serological and autopsy findings at the Presbyterian Hospital, New York City, during the past three years brings out the following facts:

First: Among cases showing anatomical evidence of syphilis at autopsy 85.7 per cent had given during life a "four plus" Wassermann with both alcoholic and cholesterinized antigens.

Second: Among 188 cases showing at autopsy no anatomical evidence of syphilis, 93 per cent had given during life a negative Wassermann with both antigens and 7 per cent doubtful reactions. The authors conclude that the Wassermann test, properly carried out, can be relied upon as an important aid in the diagnosis of syphilis.—R. A. Lambert, Miriam P. Olmstead, H. C. Stuart, *Med. Rec.*, 94, 452 (1918).

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Second Report on Bacteriological Aspects of the Meningococcus Carrier Problem.—Two sera would suffice for serological typing for the greater number of strains provided that the one was a typical Group I and the other was a typical Group II serum. There would remain some strains which were not reacted upon by either serum. The two sera employed in different laboratories would probably not be identical, as the range of activity of these sera depends to a very large extent on the particular strains used for immunization. Irrespective of cultural tests, agglutination is not sufficient, because other organisms, *e. g.* the gonococcus, may agglutinate with a meningococcus serum. A positive result of the absorption test is confirmatory, but absorption capacities are too irregular to justify any diagnostic significance from negative results. The absorption test proves nothing when the result is negative. Serological tests are not required to decide whether an organism is or is not a meningococcus. Cultural tests, if adequately performed, suffice.—Arthur Eastwood, *Jour. Hyg.*, 17, 63 (1918).

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Second Report on the Indentification of the Meningococcus.—The serological characters of 66 strains of meningococci obtained from the cerebro-spinal fluid in cases of meningitis have been studied. Serological tests of a similar nature have been applied to 86 strains of Gram-negative cocci, culturally identical with meningococci, obtained from the naso-pharynx of non-contacts. The majority of spinal strains can be divided into two main-groups by simple agglutination tests with selected spinal sera. The naso-pharyngeal strains produce active agglutinating sera for spinal strains. The naso-pharyngeal strains are not serologically separate and distinct from the cerebro-spinal strains. There is no justification for the view that naso-pharyngeal meningococci of the non-contact differ as a class from strains which might be found within the immediate environment of cases of the disease. Meningococci form a well defined species of Gram-negative cocci and can be identified in the naso-pharynx by careful application of cultural and fermentation tests.—Fred. Griffith, *Jour. Hyg.*, 17, 124 (1918).